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Do business students value design thinking and if so, how might they learn it?

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Greg Holderfield

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PRELIMINARY

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Dedication

This work is dedicated to a kind heart,

a couple of ball players,

a son of an auto mechanic and factory line worker,

and a coal miner’s daughter.

Acknowledgments

First, I wish to recognize and thank my incredible family. To my wife, Carol, words cannot fully express my gratitude for your amazing support and patience. I could not have done this without you, and this work is as much yours as it is mine. And to my children, Griffin and Grant, thank you for your patience and understanding during this difficult and demanding journey that I have been on. To my parents, Jim and Jane, thank you for supporting my creative endeavours growing up and for enabling me to pursue a career in design.

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Thank you.

Abstract

The purpose of this study is to bring a greater understanding of the value that design thinking, which Herbert A. Simon (1969) defined as ‘a process of “building up” ideas’, has for business students in the United States and how students can learn it. The researcher defines design thinking as a methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human behaviour.

The researcher’s interest in this subject, and thus this study, arose from being unable to meaningfully engage his business students in design thinking content—until the researcher launched a radical new prototype course for business students entitled Research-Design-Build (RDB), which is based more upon design culture. The iterative success of this new course led him to figure out what had happened and to develop an evidence-based specification for a curriculum that could be shared with other curriculum developers with similar courses and students.

While design thinking is often linked to literature in the service of product design, this researcher has found that a gap in the literature and academic research exists with respect to understanding the role of design thinking in United States business education and its potential value for students who are pursuing a master degree in business administration. The researcher gleaned further evidence of this gap in knowledge from business students at the host institution, Northwestern University, as well as from academics at universities ranked in the top ten nationally among business schools in the

United States. The participating business students had no prior education in design, empathic design, or design thinking. In fact, these students primarily came from quantitative educational and work backgrounds, many of which were engineering focused.

The researcher gathered primary evidence through surveys administered to three 60-student cohorts of business students in the United States over a three-year period, both pre-exposure to the design thinking course Research-Design-Build (RDB) as well as post-exposure. In addition, the researcher conducted in-depth one-to-one interviews with a selected subset of these students and conducted a survey and in-depth one-to-one interviews with peer academic members at business schools in the United States.

A significant outcome of this study is that business students in the United States perceive value in design thinking as the result of their hands-on experience in the subject, which is also connected directly to business outcomes. Furthermore, the research outcomes provide a blueprint for other business schools and educators who want teach design thinking in business schools.

CHAPTER 1

Introduction

Chapter 1: Introduction

1.1 Statement of the Problem—Design and the Business School

With ever-increasing pressure to innovate new business models, products, services, and experiences, business leaders also need to be design innovators in the business realm. This requires a different way of thinking, practising, and learning. Today's business curricula are for the most part focused on the exploitation of qualitative data from the past, which does not allow for creative exploration and thus new possibilities for innovation. In his *The Sciences of the Artificial* (1996), Herbert Simon calls for the establishment of a rigorous collection of knowledge and understanding on the design process to solve managerial problems. Roger Martin, a former dean of the Rotman School of Management at the University of Toronto, stated that 'we are on the cusp of a design revolution in business', and as a result, 'today's business people don't need to understand designers better, they need to become designers' (cited in Dunne and Martin 2006: 513).

There is obvious tension between practices based on proof and those based on creativity. Designers must use their creativity to recognise relationships between new and old information and experiences and then combine them in new and fresh ways. Creativity is a fundamental part of design and yet can often be unfamiliar to business thinkers, who focus on outcomes that can be validated and provide an immediate return on investment. Canaan (2003: 236) noted creativity as follows:

> Creativity is an instinctive urge; a powerful drive that fights logic; giving creators an unusual euphoria and generates an unmatched sense of satisfaction.

> Creativity is the core of new ideas; it's the source for new products, new designs and vision to see the world in a renewed way….Creative people share three common traits: 1. the ability to make new associations from unrelated elements, 2. willingness to pursue an idea that they know they will ultimately reject, and 3. tolerance for ambiguity over time.

The notion of creativity's genesis in non-traditional ways of thinking is furthered by Sternberg (2006: 90), who wrote that the ability to 'switch between conventional and unconventional modes of thinking is important to creativity'. He explained further,

> One aspect of switching between conventional and unconventional thinking is the decision that one is willing and able to think in unconventional ways—that one is willing to accept thinking in terms different from those to which one is accustomed and with which one feels comfortable (Sternberg 2006: 90-91).

Ultimately, the goal is to not focus on one single solution—which may be influenced by, or predetermined vis-à-vis, conventional ways of thinking—as the right solution. The goal is to creatively explore the full range of what is possible to discover new and meaningful outcomes that are viewed as highly desirable by users.

I believe that for design to have a true impact on society, it must scale within the context of a business model. Therefore, business leaders may have a greater impact than traditional designers on the use of design. As such, there is a need to educate and empower business students early on with respect to the merits of design thinking in innovation as a complement to traditional business-school teaching. This means that future business curricula will require a perspective that includes both quantitative and qualitative practice as well as a possibilities-based iteration of solutions rooted in

empathic design. As Simon (1996: 138) reflected, ‘the proper study of mankind is the science of design, not only as the professional component of technical education but as a core discipline for every liberally educated man’.

It could be argued that deeply understanding and applying those insights in combination with business feasibility and viability lead to better outcomes. For example, Motorola executive Jim Wicks (2012) noted the following:

> As a business minded technology company, we didn’t pay close enough attention to qualitative user needs and behaviours, assuming that technology alone led to success. However, we came to realize through numerous product failures that actually understanding users more deeply is critical in order to design and develop innovative solutions that people actually care about.

In describing the insights he gained through reflection, Wicks expressed aptly the conclusion encapsulated by Verganti’s (2009: 4) observation that ‘people do not buy products but meaning. People use things for profound emotional, psychological and societal reasons as well as utilitarian ones’.

In my experience, for a business student, qualitative research and empathic understanding are seen as soft skills with low measurable value. In fact, these skills require a keen understanding of people, cultures, and belief systems that might seem completely unfamiliar and unintelligible to students who look for universal answers to problems. These students often do not see value in empathy because the frameworks that support empathic understanding often do not exist specifically and explicitly in many American business-school curricula today.

It could be argued that designers and design schools do not always leverage user research to the extent they should; these schools often are predisposed to focus on the styling aspect of design, which business leaders can find difficult to accept as strategic to their success. I contend that human-centred design research supports a designer's capacity to understand and influence culture in a way that has truer meaning to the user. This can often resonate with the user in a way that is unexpected and positive.

Laurel (2003) held that a gap does indeed exist in design education with respect to qualitative research that understands and exploits empathy; so one can only imagine the extent of the knowledge gap as it pertains to its value in business education.

> Design curricula in higher education rarely include design research as a set of skills with extremely high strategic value. Designers need to understand the tools of research and how they are deployed, how they map onto the various stages in the design process, and how research findings can contribute to both innovative and evolutionary design practice (Laurel 2003:17).

In my experience as both a practitioner and educator, many business leaders and business students would assert that they use analytic, quantitative research when they do not have the skills or time and energy required to conduct contextual qualitative-design research. Furthermore, based on evidence from MBA students and academics who teach design- or innovation-centric content to MBA students in the core curriculum of the top-ten business schools in the United States, there is a lack of awareness of holistic knowledge from students that can cloud the business decision-making process and often lead to unbalanced or less meaningful outcomes for the consumer. By 'holistic

knowledge', I mean knowledge that is acquired through quantitative historical data fundamental to business-school curricula as well as knowledge acquired through quantitative user understanding, which is fundamental to empathic-design curricula.

I would also define holistic knowledge as knowledge that is balanced, in part, by varied perspectives and information. Therefore, I argue that a holistic knowledge perspective is critical to the understanding of consumers' true beliefs, values, and norms. In this thesis, I demonstrate the recognised absence of a holistic knowledge perspective in business-school education through surveys, interviews, curriculum benchmarking, and literature.

In addition to answering the question of whether business students value design thinking and if so, how they should learn it, one must look at the goal of business schools. Based on my experience, in my view, business schools pride themselves on proven pedagogical rigour that is heavily weighted towards quantitative data analysis and case-study methods. The curricula rarely include robust project-based learning that has many unknown or unforeseen variables, let alone design-centric, project-based learning. I have observed resistance to and even marginalisation of design at my own university's business school.

Furthermore, my research identifies a lack of design understanding by business students prior to taking my Research-Design-Build (RDB) course as well a core MBA curriculum that is similar throughout U.S. business schools and that does not include design as part of the pedagogy.

When designing the above course, I met with a curriculum committee of business school academics and administrators, as well as business students, to help me frame the coursework. I was surprised by the comments below, which were made during the discovery phase of my course planning.

Administrators:

- ‘This design thing, I don’t get it.’
- ‘There aren’t enough design firms to hire all our students. Design is not scalable.’
- ‘This is a business school, not a design school.’
- ‘What is the return on investment for design? How can you measure it? I doubt you can.’

Academic members:

- ‘How is design thinking any different or better from what we do in marketing?’
- ‘I think I’m very creative and I’m not a designer thinker—whatever that actually is.’
- ‘This is a rigorous place of learning, and I’m not sure my students would take design seriously. I might be wrong, but I’m not sure I see it working.’
- ‘Enough with the Post-it notes already!’

Business students:

- ‘I’ve read about design, but I guess I don’t get what it really is, and I’m not sure how I would use it. I think it’s a lot like marketing.’
- ‘Oh, you must be the design guy. You can draw. I’m not artistic at all.’

- ‘I think it’s interesting to consider design and business coming together. But what is the design part?’
- ‘I would never consider myself a designer, but maybe there is something I could use from design to become more creative. I have no idea if that is even possible.’

1.2 Personal Journey

In 1990, I graduated from the University of Illinois at Urbana-Champaign, Illinois, USA, and began my journey into the professional field of industrial design. My design journey, however, started much earlier than that. My father, James Holderfield, who was formally educated as a technical draftsperson and self-educated as a designer, introduced me to the worlds of Frank Lloyd Wright, Mies van der Rohe, Raymond Lowey, and Charles Eames when I was an impressionable high-school student. I would go on to formally study and practise design with my father, who was my high-school teacher in three different design-centric classes: engineering design, architectural design, and product design. He also would take me to design exhibits and historical architectural landmarks and share countless design books with me that influenced my future career path and life.

1.3 The Reflective Practitioner—Seeing Design Differently

I would go on to practise design in a number of consulting firms, working with global organisations in a wide variety of industries, and receive numerous global design and innovation awards. As a reflective practitioner, my personal experience has led me to

believe that true innovation that has an impact on the marketplace cannot be entirely design driven. Rather, business plays a significant role in successful innovation.

Fifteen years into my career, I found myself becoming more and more exposed to leadership opportunities as a consultant. However, I lacked an understanding of design's role in business and how business functioned outside the world of design. As the world was becoming more complicated and competitive, I believed I needed a broader perspective of all the stakeholders involved in bringing about innovation as well as a robust and differentiated set of tools to underpin my lead as a designer and thought leader in business. Simply, as a designer, I needed business skills to be valuable and relevant in a world in which business skills clearly overshadowed pure design skills.

1.4 Graduate School and the Evolving Designer—New Tools

To expand my skillset, I earned a master degree in Product Design and Development Management from Northwestern University, where I was exposed for the first time in my career to formal business content. It was within this programme—a mix of product development and business—that I gained the perspective and tools I sought as well as recognised there were many opportunities for business and design leaders to work more collaboratively to bring about holistic innovation that is informed by stakeholder empathy. I define stakeholders as all persons interacting with the offering at all levels inside and outside the organisation. I define empathy as the sharing of experiences and the understanding of people's emotions that come with those experiences.

I have evolved my own work practice to understand and use empathy as a driver to create holistic innovation rather than imposing my will and developing what would later prove to be hollow solutions without stakeholder merit. After 24 years as a designer, and approximately 150 projects in which I served as the lead designer, I've come to value the use of a holistic perspective informed by stakeholder empathy. This perspective has led me to uncover unmet and unarticulated needs where individual design and business teams did not at times. I've also witnessed how organisations resist spending quality time up front in the innovation development cycle to fully understand users in context and accurately frame opportunities from contextual insights to better inform innovation.

1.5 Design Thinking—A Process and Mindset

I define design thinking as a methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human behaviour. My experience has taught me that first and foremost, a design thinker must have an optimistic mindset; when designers are truly innovating, they are often in a space that is unknown and uncomfortable, which makes it difficult to effectively develop and push ideas. Therefore, based on my academic and professional practice experience, I believe it is critical to reframe one's perspective around what is possible and to keep a positive attitude. It is also my belief that an individual must possess the following 10 traits to be an effective design thinker:

1. An observing eye and constant sense of wonder (what is possible, not what is probable)

2. An empathetic attitude towards people's behaviour and habits (qualitatively based on in-context observation and discovery)
3. A mind that questions beyond what is obvious
4. An ability to remain patient in the problem space until the most meaningful questions are identified (problems are opportunities in disguise)
5. A holistic approach to problem-solving
6. A willingness to experiment and build (doing!)
7. A passion for team-based collaboration that puts the user at the centre of the opportunity challenge
8. A willingness to always be sharing
9. An acceptance of the messy (design thinking is not neat)
10. A commitment to lifelong learning

While some may contend that design thinking is simply a fad or experiment, I would argue that design thinking is a process that thrives on participation beyond the world of design. Anyone and everyone can and should participate in design thinking. It is not an experiment. It does, however, empower and encourage us to experiment in the service of what is possible. Design thinking, when applied to business problems, enables individuals and organisations to better understand their competitive and operational landscapes.

When I have asked my business students to define design thinking, I have been amazed at the range of answers. And while many definitions abound, one could argue there is no single definition of design thinking. Most educators and practitioners, however, hold on to the idea of design as a way of thinking. This definition can be traced back to Simon

(1969 cited in creativity-innovation.eu 2017) who claimed critical thinking as a process of ‘breaking down’ ideas, while a design-centric way of thinking is a process of ‘building up’ ideas. He also defined design as ‘the transformation of existing conditions into preferred ones’ (1969: 55). He contended that design is connected to an improved future intention.

1.6 Teaching Business Students—A Path to Scale Design

Over time, I became more interested in teaching people to become holistic innovators rather than simply product developers. I wanted to expand the impact of design and realised through my professional practice and graduate school education that the key to doing so was to educate students in more than the traditional principles of design. In 2010, I shifted my focus from professional design consulting to that of an academic, teaching design thinking to engineers at Northwestern University. I believed that the contextual and qualitative experience of design thinking would complement the analytic and qualitative nature of engineering and that understanding and practising would create the catalyst for holistic innovation. However, I quickly determined that business students, who would go on to become future global leaders and have the power to unleash design on a bigger stage, interested me the most as a teacher.

In 2013, I was presented with the opportunity to redesign a dual-degree programme at Northwestern: a master of business education (MBA) from the Kellogg School of Management and a master of engineering management (MEM) from the McCormick School of Engineering. I would shift the dual-degree focus from business and manufacturing to one of business and innovation. With marketplace competition so

fierce, I believed innovation would be more meaningful at scale if future business leaders leveraged design thinking as a complement to the quantitative approaches in the business world. Within this new innovation-centric offering, I would develop and teach the first design thinking course to business students at Northwestern University. This new offering would emphasise a qualitative design thinking approach to problem-solving and new value creation.

However, design and business speak a different language and are often misaligned in both perspective and mindset. As such, I initially designed the course to be more business-school centric, relying on cases, readings, and detailed lectures to large classes of students, which in the business school can range from 70 to 150 students. I designed my course using the same structure that my peers in the business school used. The results were disastrous on many levels.

In the classroom, I witnessed resistance by many business students to embrace a design thinking mindset and methods due to the perception that both are ‘fuzzy’—not quantifiable—and are not directly connected to historical proof points that can be easily validated. This narrow point of view often led my business students to choose paths of least resistance when conducting research and ideating solutions based on contextual insights. It seemed to me the students did not fully understand the value of the content, which was unfamiliar to them, because they were not experiencing it in a way that was authentic to deeply engaged contextual field research. They struggled to gain empathy for their end users because they only read about empathy. And they failed to iterate solutions because they often worked on assignments alone and not with their peers. For

my part, the large class size and lecture format made it difficult for me to connect with every student.

The problem, I realised, was that I had developed a design class for business students using a business-class format, and it proved to be totally opposite of what I had experienced as a designer working in the industry. I received the lowest teaching ratings of my career and knew something had to change—specifically, I needed to teach business students design thinking in a way that would equip them to lead not only as business people but as business design innovators. I had come to understand more clearly what Schön (1983: 8) meant when questioning the epistemology of practice and the necessity to explore the subject of design in a deeper way, as he recognised that ‘competent practitioners usually know more than they say’. Weightman and McDonagh (2006) supported this view when they note that education lags behind current design practice by 10 years and that designers exhibit an implied understanding of design through practice.

As a formally educated and trained designer, I realised that I would need to go back to my past experiences to develop a way of authentically delivering design thinking content to business students in an appropriate way so that they could effectively learn it. This path forward would require a different approach to learning than these students were used to at the business school.

My ultimate goal was to move beyond tacit knowledge and define the opportunity with a structured curriculum that worked for business students to learn design thinking, not

only at the Kellogg School of Management at Northwestern University, but also other business schools both domestically and internationally. I explored this approach through qualitative academic research that leveraged the perspective of business-school students and academic members at Northwestern University, as well as highly regarded academic members at other business schools in the United States.

1.7 Design- and Business-School Student Attributes

In my 26 years as a professional designer and educator, I have had a unique vantage point into the attributes and skills of both business-school students and design-school students. It is my opinion, based on this experience, that there are distinct differences between these two groups, a view supported by experts in both professional practice and academia (see Table 1).

Traditional MBA programmes focus more on analytical problem-solving, quantification, and case studies, but in the rapidly changing global business world, there is a need for more innovative approaches in the creation of new products and services, to creative problem-solving, and to our understanding of and empathy for users. At the intersection of these foci are a real opportunity and significant competitive advantage for hybrid innovation, decision-making, and leadership. What industry needs is not just an MBA or design graduate but a blending and partnering of the two.

The following attributes and skills (see Table 1) from both the design-school and business-school worlds are based on my experience and discussions with business-school and design-school students in the United States as a precursor to my research. It

is critical to understand the differences and strengths of each school to see how they contribute to a hybrid model.

Table 1. Attributes

Attributes

DESIGN SCHOOL STUDENT ATTRIBUTES (HOLDERFIED)	BUSINESS SCHOOL STUDENT ATTRIBUTES (HOLDERFIED)	ATTRITBUTES (CITED)
Qualitative Analysis	Quantitative Analysis	Martin, R. (2009)
Possibility Based	Probability Based	Brown, T., Katz B. (2009)
Divergent Thinking	Convergent Thinking	Hudson, L. (1966)
Imaginative	Rational	Lawson, B. (1990)
Maker Oriented	Simulation Oriented	Doughtery, D. (2015)
Intuition Based	Proof Based	Durling, D., Cross, N., Johnson, J. (1996)
Micro Perspective	Macro Perspective	Datar, S., Garvin, D., Cullen, P. (2010)
Descriptive Understanding	Predictive Understanding	Parlett, M. et al. (1988)

These attributes are detailed as follows (based on my experience and discussions with business-school and design-school students in the United States as a precursor to my research):

1.7.1 Design-School Student Attributes

Qualitative Analysis

Design students thrive in the qualitative world of discovery and understanding. They use contextual fieldwork (interviews and observations of small sample sizes) to understand the actual problem behind the perceived problem. For example, a design

student at Northwestern[1] had this to say about the fieldwork he conducted on a medical records project for Northwestern Memorial Hospital in Chicago:

> Seeing the patient unable to navigate her hospital records first-hand was very enlightening to me and the team. What we thought was a simple and straightforward series of directions and prompts proved to be complex and intimidating for the patient. Our team gained empathy for her and her family as they tried to understand what to do next. We had no real idea how scary it could be.

Possibility-Based

Design students have a wildly optimistic mindset, which is critical because they often are imagining a futuristic solution. 'What could be possible' is a question often asked by designers as they push the boundaries of the current state of being. Possibility-based thinking is fundamental in the early stages of innovation; design students excel at this skill. A Northwestern design student[2] exemplified this when she stated, 'For me, the real magic in designing is stretching the boundaries of what is expected'.

Divergent Thinking

A divergent way of thinking is the ability to develop different or iterative concepts based on a particular theme or challenge. Design students practise divergent thinking by

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[1] Male undergraduate in mechanical engineering who was earning a graduate degree in design innovation at Northwestern University in 2016

[2] Female undergraduate in computer science who was earning a graduate degree in design innovation at Northwestern University in 2016

exploring as many ideas as possible early in the innovation process through brainstorming, rapid visualisation, and prototyping. The idea of divergent thinking is to create meaningful choices that run a range of possibilities as opposed to arriving at one final solution.

Imaginative

An inherently imaginative perspective is fundamental to designers. The level of their creativity and originality often defines them, and in the design classroom, it becomes quickly obvious who skilfully processes and can demonstrate this attribute through a range of creative thought and action. A student[3] at Northwestern reflected on her first encounters with imaginative thinking in the classroom:

> I took a design class at Northwestern as an elective and quickly realized that my ideas were less than breakthrough when compared to more design students in the class. I would have never gone where they did for the most part. I kept getting stuck trying to generate great ideas because I kept focusing on how to build my first idea.

Maker-Oriented

This attribute is linked to the ability, wherewithal, and courage to make something. Prototyping is essential to design discovery and refinement, and as such, the concept of

[3] Female undergraduate in mechanical engineering who was earning a graduate degree in design innovation at Northwestern University in 2016

design thinking can be realised only through design doing. A student[4] at Northwestern discussed the differences between individuals who are maker-oriented and those who are not:

> The really successful innovators in our organization are very maker-oriented. Most have design backgrounds and simply know how to get things done. They are not afraid to prototype and learn from experimentation. On the other hand, we also have a large number of MBAs on innovation teams who are very much the opposite. They're less inclined to build and iterate and more inclined to talk about process. What often happens is that they often don't uncover meaningful value because they don't ideate and prototype. Process is critical, but you need to actually participate to realize and discover user value.

Intuition-Based

Intuitive-based decision-making is an attribute in which information acquired through associated learning. This new information is gained unconsciously, informing the foundation of a decision. Designers often use intuition as part of the synthesis process of understanding contextual field research.

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[4] Male student with an undergraduate degree in mechanical engineering and a graduate degree in design innovation at Northwestern University, SAP Innovation Lead

Micro Perspective

Designers use small sample sizes to understand people and their problems in a more personal way. This micro perspective allows designers to gain an empathic perspective that is difficult to attain when using big data.

Descriptive Understanding

To even begin to understand the true content of the challenge, designers often immerse themselves in the contextual experience of those involved. What people say they do is often different from what they actually do, and thus the lived experience provides the foundational grounding needed to begin the design process. A Northwestern student[5] exemplified both the micro perspective and descriptive understanding attributes on a project:

> When I was working on a food-related design project for class, I found myself in the kitchen pantries of six users to better understand their actual eating-at-home behaviors. They all told me they stayed away from carbs, and yet their pantries were full of carb-heavy food products.

1.7.2 United States Business-School Student Attributes

Quantitative Analysis

Business students thrive in the quantitative world of data and are comfortable making decisions that are rooted in large data sets they deem valid. Quantitative skills are

[5] Male student with an undergraduate degree in mechanical engineering who was pursuing a graduate degree in design innovation at Northwestern University in 2016

fundamental to acceptance to business schools and prolific in the actual coursework of the MBA. The following conviction expressed by an MBA student[6] at Northwestern illustrates this thinking: ‘Data gives me the means to make decisions at scale. I need proof’.

Probability-Based

Business students more often than not find themselves justifying decisions based on what information is known. This historical knowledge can be limiting when one is trying to innovate something new.

Convergent Thinking

Business students have an uncanny desire to get laser-focused very quickly, trying to make an idea ‘real’ right away. In an effort to justify and scale the idea, they jump to known constraints and opportunities to scale from an initial idea to a probable business solution, as exemplified by the feelings of an MBA student[7] at Northwestern: ‘Ideas are cheap. I want to know if it’s real sooner rather than later’.

Rational

Business students, often focused on execution and the realisation of financial profits, take a very rational or pragmatic approach to making decisions. They often rationalise

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[6] Male student with an undergraduate degree in mechanical engineering who was earning an MBA at Northwestern University in 2016

[7] Male student with an undergraduate degree in computer science who was earning an MBA at Northwestern University in 2016

choices based on the feasibility and viability of the idea at the very beginning of the innovation process.

Simulation-Oriented

Business students often use mathematical simulations to measure the success or failure of ideas, measuring desirability through the use of big data surveys. This kind of approach is valued over others, as expressed in the following quotation by an MBA student[8] at Northwestern: 'Why should we talk to eight people in their kitchens about healthy cooking when I can put a survey up online and get hundreds if not thousands of responses?'.

Proof-Based

Business students often want proof of intent or profitability well before new ideas can justify either. This need for early proof hampers MBAs from creating something truly innovative, and as such, their ideas are, more often than not, incremental.

Macro Perspective

Business students use large sample sizes to understand segmentation and financial viability. This perspective, informed through big data analytics, is good at improving existing things because it is fundamentally rooted in the reporting of explicit needs. However, it fails to reveal latent needs and therefore can lack the perspective to inspire new possibilities.

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[8] Female student with an undergraduate degree in finance who was earning an MBA at Northwestern University in 2016

Predictive Understanding

Business students inherently desire the ability to control outcomes, and they look for predictive trends to help directionally frame and scale innovation. While there is no doubt that predictive analytics has value, I would argue that a reliance on such understanding can restrict the opportunities that data do not reveal. It is often the unmet or unarticulated insights that lead to new value and not simple historical insights.

1.8 Significance of the Subject

While business thinking is often regarded as a critical component of leadership, my experience has shown me that design and design thinking skills are often considered less important. However, in my opinion, we now live in a world of increasingly complex, interdependent ecosystems, and so it is simply not enough to live, work, and learn in either a 'design' world or a 'business' world, which currently are mostly independent of each other. Thus, I feel it is critical for design thinking to reach a more diversified audience than just the design community: we are seeing traditional management consulting firms such as Deloitte, Accenture, and McKinsey build design-centric innovation practices inside their core businesses.

According to the 2015 results of the Design Value Index (DVI), design-led organisations have maintained a significant stock market advantage, outperforming the S&P by 211% (see Figure 1) over the last 10 years. The DVI was developed by the Design Management Institute (DMI) and Motiv Strategies as a way to measure the value of implementing design management practices in an organisation. The

organisations represented in the Design Value Index are required to meet six specific criteria for inclusion that includes the following:

1. Design operates at scale across the enterprise.
2. Design holds a prominent place on the company's organisational chart, and either sits on the leadership team or directly reports to a leadership team member.
3. Experienced executives manage the Design function.
4. Design sees a growing level of investment to support its growing influence.
5. Design enjoys senior leadership support from the top tier of the organization.
6. The company has been publicly-traded on a U.S. exchange for the last ten years and thereby adheres to GAAP accounting rules.

   (Design Management Institute n.d.)

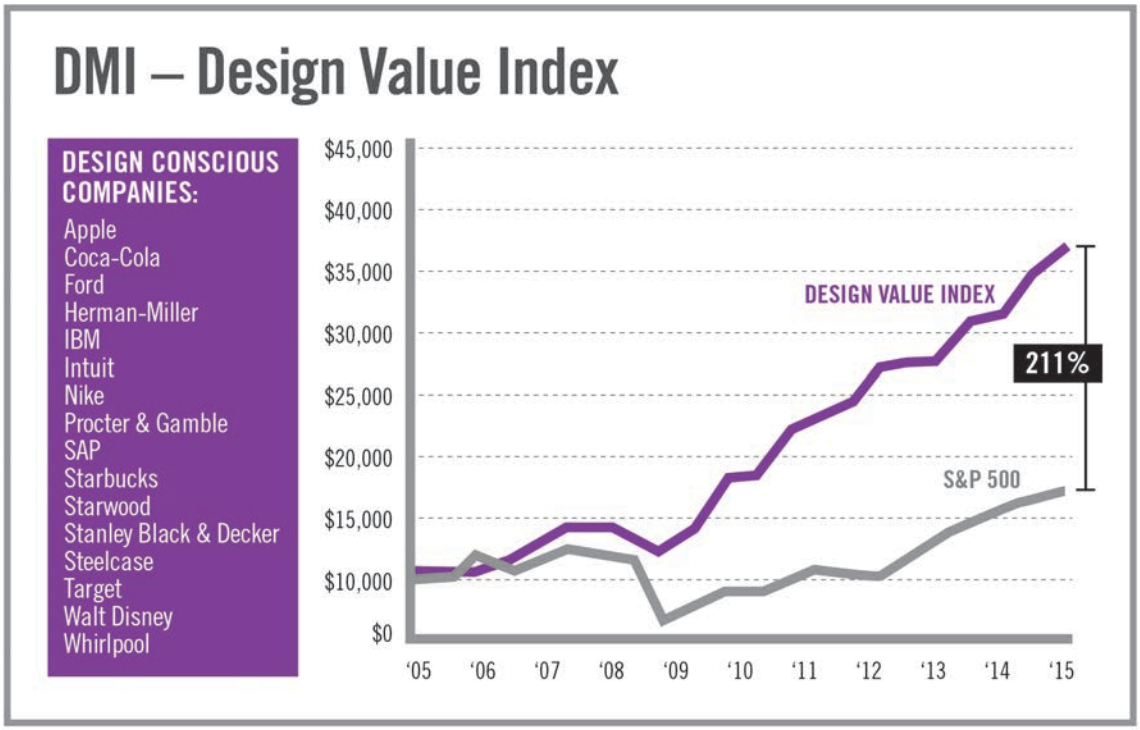


Figure 1. Design Value Index

(Design Management Institute n.d.)

Relevancy is dependent upon a strategic overlap in the worlds of design and business, and at this intersection, we can prepare for our future through a well-articulated understanding of the value of design in the context of business. This education value proposition needs to be such that both design and business have a shared vision that is mutually beneficial and rigorous. Today, this simply does not exist.

That said, this education value proposition will need to be carefully vetted through a business-centric lens due to the fact the business schools have the upper hand over design schools in both scale and value creation. Designing for the sake of art without process, rigour, or execution fulfilment has given design a bad reputation in the halls of business schools. Design is often taught in the 'College of Art' and often lacks credibility in the business world because of a perceived lack of rigour, discipline, and process. This limited perspective is at the heart of the tension in trying to establish collaborative learning and activation of design in business.

On the flip side, based on my experience in academia, is that business schools often emphasise a linear optimisation approach to business rooted in historical data and narrow in both mindset and perspective. Jumping to narrowly informed conclusions and consequently solving the wrong problem, ignoring creative approaches to innovation, and failing to empathise with stakeholders are all shortcomings of business that can be found in many business education models today.

Perhaps the best way I can personally express the need and relevance of my subject is through a conversation I had with a senior administrator at the Kellogg School of Management at Northwestern University. He asked why I thought design was important to integrate into the teaching of MBA students. He said he viewed design as just a visual treatment to a product and design thinking as a conversational fad. He then said that if we engaged in design and other schools followed, we would lose our competitive edge. I responded that we teach finance, strategy, and marketing, just as every business school does, and that that has not been a problem. If we are to stay relevant, I explained, we need to augment our business-processes approach with a possibility-based approach of thinking and doing through design to allow us to innovate a better future. However, it is not enough to have business students take design classes and vice-versa. No one has looked closely at the opportunity and designed an ideal educational experience in this space that has scale as well as a pedagogy that is understood, agreed upon, and wildly supported in the halls of academia and industry. In the end, the senior administrator agreed to agree to my response, but he struggled to justify it because it was not validated with 'proof'.

Yes, design thinking is all the rage, and there are a number of books, articles, and educational platforms in the academic and consultative fields that address it well. I strongly believe, however, that the principles of design thinking just scratch the surface of what is needed in a well-crafted and actionable business-school pedagogy.

As Roger Martin (2009), a former dean at the Rotman School of Business at the University of Toronto, stated in his book, *Design of Business*, one cannot just out-

perform competitors—rapid and perpetual change requires one to also out-imagine competitors. To do that, Martin (2009) further explains, one must not only think like a designer—one must become a designer. Furthermore, Brown and Katz (2009: 3) stated the following:

> A purely technocentric view of innovation is less sustainable now than ever, and a management philosophy based only on selecting from existing strategies is likely to be overwhelmed by new developments at home or abroad. What we need are new choices—new products that balance the needs of individuals and of society as a whole; new ideas that tackle the global challenges of health, poverty, and education; new strategies that result in differences that matter and a sense of purpose that engages everyone affected by them. It is hard to imagine a time when the challenges we faced so vastly exceeded the creative resources we have brought to bear on them.

And Williams (2015) noted that the greatest innovative opportunities can often be discovered in those areas that seem unbroken, that seem stable and constant. Too often, those are the areas that go unnoticed because of their stability and constancy.

I strongly believe that my research will complement current knowledge as I advance what is known, uncover what is not yet understood, and craft an actionable position that will not only contribute to academic knowledge but will be used as a blueprint to design future education models that thrive at the intersection of design and business. This study is the first of its kind to set about quantifying what business students value about design thinking, how business-school academics view design as it relates to business education and innovation, and how MBA students can best learn design thinking. It is my hope

that a new ‘hybrid’ pedagogy will be universally adopted and that expectations for learning design thinking in business schools will be fulfiled.

1.9 Research Framework and Questions

1.9.1 The Approach

The aim of this research study is to search for an understanding of design thinking in the context of business, understand current MBA subject matter in United States business schools, and determine how much business students value design thinking and how they can best learn it. The intent of this study is to validate a recommendation for a standardised design course for MBA students at the Kellogg School of Management at Northwestern University as well as at other business schools.

This study addresses institutions that offer MBA programmes in the United States that do not teach empathic design but might be open to it if it were academically rigorous and centred on project-based learning that stands up to peer review. A standard is needed for business schools that seek to teach design but are unsure how to go about it in the context of business-school curricula. The ontological reality is that design in the context of business is misunderstood, and MBAs have a limited understanding of its value and how it interacts with an MBA education. The teaching of design in the context of business-school education needs to be based on a systematised approach that is understandable, authentic, and repeatable for MBA students to practise and act upon.

I argue that design thinking can help business students develop user empathy and allow future business leaders to make better decisions based on holistic knowledge. In framing my overall approach to this project, I looked closely at a variety of academic perspectives as well as reflected upon my practice as a design professional and practitioner, after which I found myself situated as an interpretivist. I have consistently practised as an interpretivist seeking to understand social behaviours, and as a designer, I have often used a variety of qualitative research methods. Such a qualitative approach is concerned with the interpreting of individuals, perspectives, and experiences, and I have lived this approach in my career as a human-centred designer and educator. As defined by Walliman (2000: 362), interpretivism is 'the standpoint that recognizes the embedded nature of the researcher. It rejects the assertion that human behaviour can be codified in laws by identifying underlying regularities, and that society can be studied from a detached, objective and impartial viewpoint'. As an interpretivist, I am able to see, process, and synthesise insights in a design thinking manner that allows for in-context discovery of what is both articulated and unarticulated. Taking it further, Creswell (2003: 365) argued, 'Qualitative research takes place in the natural setting. This enables the researcher to develop a level of detail about the individual or place and to be highly involved in the actual experiences of the participants'.

As an interpretivist, my approach to this work is clearly different from the approach of a positivist, who uses scientific methods that are meant to analyse the social world and who seeks to explain 'what is' through the use of predictive metrics and large data sets. According to Walliman (2000: 365), 'A positivist approach is one that has an epistemological stance that maintains that all phenomena, including social, can be

analyzed using a scientific method. Everything can be measured'. Again, based on my academic experiences in the business school, students of business generally follow a positivist approach.

1.9.2 The Process

The basic research is from the point of view of a constructivism paradigm, using both qualitative surveys, one-on-one interviews, and comparative studies of curricula. The sampling will be purposive, as the participants come from three subsets: MBA students from the Kellogg School of Management at Northwestern University, academics at the Kellogg School of Management at Northwestern University, and academics at other MBA programmes in the U.S. I use three subsets for triangulation to better understand the perspective of each of the three groups.

The selection criterion of participating students is based on students who have taken the MBA course, Research-Design-Build (RDB). Their backgrounds are mostly in engineering, finance, economics, or business. None of the students has had a background in design.

Academics from the Kellogg School of Management are identified as senior members who teach design-centric or innovation content to MBAs. I use the term 'design-centric' to capture the overall theme and may include organisational, product, or service design. It does not include design thinking.

I selected academics from other MBA programmes who have taught design thinking content to MBAs at a top-ten business school in the United States, have been recognised for design thinking thought leadership, and who teach MBAs outside of the top-ten business school programmes in the United States.

1.9.3 The Boundaries

I had the unique opportunity to conduct much of my primary research at one of the most highly regarded academic institutions in the U.S. My academic laboratory for this research was the Kellogg School of Management, which was ranked in 2016 as the 5th best business school nationally by leading business publications, as noted in Table 6 (it is currently ranked as the 4th best business school nationally by *U.S. News and World Report* [2018a]—tied with MIT and Stanford). It is at Northwestern University, ranked 12th nationally in 2016 (ranked as tied for 11th nationally by *U.S. News and World Report* [2018b]), that I teach design thinking, design strategy, and industrial design primarily to students of engineering at both the undergraduate and graduate levels. My academic appointment is within the McCormick School of Engineering, and my home department is mechanical engineering.

It is at Kellogg that I prototyped and taught a first-of-its-kind design thinking course that integrated design and business in the business school. This course and the students who participated are at the foundation of my research. Specifically, I conducted surveys and interviews over a three-year period with MBA candidates at the Kellogg School of Management. I limited participation to business students who had taken my newly created design thinking prototype class for MBAs, Research-Design-Build (RDB), in

the first quarter of their first year. The course was offered twice a year and was limited to thirty students per section. A total of 180 MBA candidates participated in the research over the three-year period; 474 MBA candidates per year in the business school did not participate.

In addition, I conducted surveys and interviews with ten academics who taught innovation/design-centric content to MBAs. I identified five academics at Kellogg as well as three academics from peer business-school institutions ranked in the top ten in the U.S. Additionally, academics who taught in institutions outside the top-ten ranking participated, as they were recognised as thought leaders in the area of study. While I recognise the boundaries of the size and geographic scope of my research, I also consider the unique opportunity to conduct this research at a top-five business school that has never offered design thinking content to its students before.

1.9.4 The Question and Considerations

The intent of my research is not to criticise business-school teaching pedagogies or to make judgements as to the knowledge gap business-school students possess with respect to understanding and using design thinking. The purpose of the research is an attempt to identify the value of design thinking for business students and how they can best learn.

The research question is as follows:

- Do business students value design thinking, and, if so, how might they best learn it?

This question will be informed by the following considerations:

- Students' backgrounds in analytics and creativity, quantitative and qualitative data, empathy, and design thinking before business school and prior to taking the design thinking class
- Students' experiences with a design thinking approach, the environment for learning, how they inform empathy and decisions through data, and the context for learning design thinking after having taken the first design thinking class
- The elements and characteristics that are important for students when learning to be design thinkers from peer academic members who teach design thinking at business-school institutions other than the Kellogg School of Management at Northwestern University
- Students' experiences before and after Research-Design-Build (RDB), the difficulties in learning, and the values they place after their design thinking experience with the following specific design thinking elements: ethnographic research, empathy, identifying the right problem to solve, framing the right problem to solve, visualising ideas, developing more than one solution, storyboarding, prototyping, iterating solutions, critique, creativity, and studio culture
- The value the students place on design thinking as a differentiator and a competitive advantage after having taken the design thinking class, Research-Design-Build (RDB)
- How design thinking is utilised at peer academic members' universities—its importance in business-school education, the understanding and impact of

design thinking in the decision-making of their students, success stories, struggles, and the overall value of the topic

1.10 Summary

This chapter presents my definition of design thinking, and the introduction of my research and its rationale to bring a greater understanding of the value design thinking has for business students and how they might learn it. The principal outcome is one of aiming to bring a greater understanding of the value that design thinking has for business students at the Kellogg School of Management at Northwestern University, while also providing new knowledge with which other business schools in the United States could use or iterate upon in order to improve the teaching of design thinking to future business leaders.

I conducted research with business students and academics at my primary research lab, Northwestern University, as well as with outside academics and curricula at peer institutions. The specifics are as follows:

- Understand the perceptions of empathy and design thinking held by MBA students before and after taking the Research-Design-Build (RDB) class
- Understand if business students value design thinking
- Understand how business students can best learn design thinking
- Understand if design thinking presents a competitive advantage for business students

- Understand how business school academic members teach innovation-centric coursework at the Kellogg School of Management at Northwestern University
- Understand how business school academics at peer business-school institutions teach design thinking
- Understand curricula at peer business-school institutions teaching design thinking-centric content

The literature review focuses on the following areas:

- Designerly ways: what designers do
- Design and business: context and learning
- Business school: context an curriculum

CHAPTER 2

Literature Review

Chapter 2: Literature Review

2.1 Introduction to the Review

This chapter is a summary of literature related to understanding whether business students value design thinking and if so, how they might learn it. Much research in this area is general—for example, in how design thinking applies to design practice, rather than the integration of design thinking and business. There are even fewer publications focusing on how design thinking can be taught effectively and learned in business school. Therefore, this review focuses on the ability to understand and use design thinking, empathy, and creativity in business school teaching and learning.

The approach here follows the process by Creswell (1994), suggesting that in qualitative research, which utilises multi-methods, literature should be used in a way that is consistent with the researcher's methodological assumptions. He further suggests that the literature be used inductively. Saunders and Rojon (2011: 161) offered a basic checklist for evaluating the relevance of literature against research topics, and these include the following:

1. Is research that is most relevant and significant to the topic identified and included?
2. Is this research discussed and evaluated using a clear structure that will be logical to the reader?
3. Is the work of recognised experts on the topic identified and referred to?
4. Are the research aim(s) and objective(s) explicitly stated and contextualised?

5. Is research that supports and research that opposes the main arguments included, using clearly reasoned judgements?
6. Are points made logically and justified with a valid argument and/or evidence?
7. Are fact and opinion distinguished clearly?
8. Is relevant research that has been published since the start of the project included?
9. Have all sources been referenced fully in the required format?

Two aspects of this list were especially challenging. First, research publications are often discipline-specific and not specific to the teaching of design thinking to business students. Second, as literature is somewhat limited as it relates to the specific topic, it could possibly be considered biased. Third, it follows that there may be omissions in the published research. This review, therefore, organises findings by subject areas closest to the integration, teaching, and learning of design thinking by business students. The chapter concludes by analysing different approaches to teaching design thinking-centric content that have been tried in business schools. The structure is as follows:

Table 2. Literature Category and Subject Structure

(author table)

Categories and Subjects Identified:
DESIGNERLY WAYS: What Designers Do
• Design
• The Role of Creativity in Design
• Design in Innovation
• Design Thinking
• The Role of Empathy in Design Thinking
• Design Thinking and Strategy
DESIGN AND BUSINESS: Context and Learning
• The Business Gap for Design
• Design and Business School
• Design Thinking and Business Thinking
• Design Based Learning for Business
BUSINESS SCHOOL: Context and Curriculum
• Business School Contex
• Business School Backgrounds and Curriculum
• Business School Required Core Curriculum

This section provides a backdrop for these issues.

As with the nature of qualitative research, the use of the literature is based on the assumption that knowledge can be gained through the understanding of the perspective of the literature participants and then building on what is understood. Qualitative research uses literature to set the stage for the study, and thus it frames and supports the findings and knowledge development. The reviews of literature will include an

interpretivist analysis based on years of professional practice and teaching by the researcher.

2.2 Designerly Ways

2.2.1 Design

Table 3. Design Descriptions

(author table)

Design Has Been Described As:

DESCRIPTIONS	CITED
The Creation of Artifacts	Simon, H. (1996)
A Reflective Practice	Schön, D. (1983)
A Problem-Solving Activity	Buchanan, R. (1992)
A Way of Reasoning / Making Sense of Things	Cross, N., (2006) Lawson, B. (2006)
The Creation of Meaning	Kippendorff, K., (2006) Verganti, R. (2009)

When asked, 'Is design an art, a science or a form of mathematics?' Jones (1992) explained the difference in terms of working realms of time. Designers exist and function in a realm of time—the imagined future—different from that of scientists, artists, and mathematicians. Scientists and artists function in and work with the physical world, whereas mathematicians function in and work with a realm free from time as we know it—that of abstract relationships. Designers, however, function in a possible future and work to make real the unforeseen, bringing to existence to its fullest potential that which does not yet exist.

In the researcher's experience, the word 'design' has often been associated with the artful creation and development of tangible products. However, design is not just about creating beauty. Also in the researcher's experience, while aesthetic is important, it is simply one of many things that need to be considered. Nevertheless, the idea that design is connected to the development of beautiful objects has deep roots that first emerged during the Industrial Revolution. Mass production and the early abilities of industrial designers to stylise objects with ornamentation popularised the common perceived understanding of what design is.

Design is more than simply the style of an object. Dorst (2015: 42) supported this idea when he said, 'Despite all the years of evolution away from these early form-focused beginnings, the image of beautification still accompanies the popular notion of design'. While also stating that design needs to be conducted in what Dorst (2015: 42) further described as a 'very specific manner, to explore solution possibilities within a constrained setting', Rusk (2016: 188) stated that design is the 'pursuit of new ways of thinking to generate new ideas, release new energies and new possibilities'. However, according to Faust (2016: 27), 'design is problem solving'. Buchanan (1992) positioned design at the intersection of constraints, contingencies, and possibilities. Buchanan (2001: 191) further argued that 'design is the human power to conceive, plan, and realize products that serve human beings in the accomplishment of any individual or collective purpose'.

It may be argued that design is—at its core—a human activity that is often difficult to describe. One could argue that design essentially finds, frames, and seeks to resolve

problems through understanding, creativity, optimism, inclusion, and reflection. According to Brown (2008: 1), ‘Design thinking is a methodology that includes a full spectrum of innovation activities with a human-centered design ethos’.

However, as Dorst (2015: 43) further argued, design is a balance of analytical thinking, rigour, and playfulness:

> There is nothing ‘soft’ or vague about designing. Despite a deceptive playfulness in a conceptual phase of a design project, design ultimately needs to be rigorous in its approach if it is to deliver results for the real world….The best designers are all very strong analytical thinkers with an original and playful bent of mind….People sometimes see design as irrational because designing is not a completely objectifiable, closed form of rationality: design is inherently open-ended, as there is always more than one solution to a design problem. Design is not about creating ‘solutions’ in the same sense that we create solutions to mathematical equations, as absolute truths in an abstract world.

Schön (1983: 67) described design as a process of ‘framing’ the problem, which is a form of ‘seeing’, followed by ‘moves’ towards a solution, and then the ‘evaluation’ of these ‘moves’. It is in the ‘evaluation’ phase that new ‘moves’ may be realised as well as new frames of seeing the problem. As such, designers do not focus on the generation of the one winning idea. Instead, designers work in a deliberate and thoughtful way that is process based.

Tovey (2016: 14) stated that design is a complex activity and is rooted in creativity, averring that ‘designing is a peculiar process with its own culture and atypical thinking

processes. It is also an international activity of great economic significance'. The Cox Review of Creativity in Business appeared in 2005. In it, design is defined as follows: 'Design is what links creativity and innovation. It shapes ideas to become practical and attractive propositions for users and customers. Design may be described as creativity deployed to a specific end' (Cox 2005: 2). Darke (1979) argued that a very important and distinguishing characteristic of design is the early stage production of a design idea that she defined as a 'primary generator'. It is this early design idea that allows for a process of conjecture and analysis. Similarly, this approach to designing, in which there is the development of an early concept solution, has been characterised by Lawson (2005) as a solution-led approach.

Furthermore, Lawson and Dorst (2009: 24) said, 'Designing is a complex and sophisticated activity, and one which is usually regarded as inherently creative. It remains one of our least well understood cognitive powers and one of the most difficult to teach'. Design can also be characterised as solution-led, in that it seeks to develop many ideas and iterate from learning from each iteration. Tovey (2016) argued that the solution-led approach is a process of shifting from the abstract to a visual approach. This is at the fundamental core of design. Tovey further explained that hypothesising a solution early in the solution-led approach gives designers a lens through which to re-examine the problem—this reveals the place(s) where more data are needed before any progress can be made in the design.

The solution-led design process can be further characterised as different from the processes associated with social or scientific analysis, which are more clearly

understood in other disciplines. As such, a solution-led approach demands a holistic understanding of the opportunity and the ability to iteratively respond to problems through adaptive concepts.

This solution-led approach was defined by Cross (2006) as the 'Designerly Ways of Knowing'. Cross (2006: 7) further explained the 'delight' of being a designer:

> In order to cope with ill-defined problems, the designer has to learn to have the self-confidence to define, redefine and change the problem-as-given in the light of the problem that emerges from his mind and hand. People who seek the certainty of externally structured, well defined problems will never appreciate the delight of being a designer.

Cross identified a designerly way of knowing as a generic design capability that contains five aspects. According to Cross (2006: 29), they are as follows:

- Designers tackle 'ill-defined' problems.
- Their mode of problem solving is 'solution focused'.
- Their mode of thinking is 'constructive'.
- They use 'codes' to translate abstract requirements into concrete objects.
- They use these codes to both 'read' and 'write' in the 'object languages'.

This idea of translating, as Cross noted, and/or redefining, requires a shift in perception—in other words, seeing the problem differently than originally perceived. As such, reframing is fundamental to designerly activities. Dorst (2015: 134) further contended that this can be difficult for designers and non-designers alike, stating the following:

> The problem-solving capacity in our society is implicitly organized by type of solution, rather than by type of problem. The professions we are in and the roles we define in organizations are defined by a discourse and a worldview that inadvertently push us in the direction of predetermined solutions.

Dorst (2015: 136) further explained that our over-reliance on rationality as the foundation of all discussion and action has so deeply embedded itself into our culture that we feel the need to apply a clear and rational explanation to everything we think or do. In describing the designerly process, Kolodner and Wills (1996) noted that designers often tackle problems through solution opinions, instead of analysing the problem and then developing alternative solutions. By contrast, Simon (1969) argued that the sciences conduct descriptive analysis, seeing the world as a given.

2.2.2 The Role of Creativity in Design

Design and creativity simply cannot be separated from one another. According to Tom and David Kelley (2013), designers do not make excuses for why they cannot do something, but rather they look for new ways to explore those opportunities. In fact, Tom and David Kelley (2013: 3) defined creativity as ‘using your imagination to create something new in the world’. They further claimed that by being confident and unafraid creatively, designers may have the ability to create positive change in the world around them through innovative solutions. It may therefore be argued that creativity is fundamental to the value proposition of innovation. Creativity enables designers to problem-solve in unexpected ways and can inspire individuals and organisations to push boundaries in such a way that leads to new possibilities. However, Brown (2008) and Kelley and Kelley (2013) contended that designers are often associated with developing

new ideas and that business leaders are often associated with acting and or executing the idea at scale. Martin (2009) argued that this siloed approach to innovation is becoming less relevant. The business world therefore lacks creative capacity of thought, and the development of creative thinking may be seen as significantly lacking in business schools. This could have a direct impact on innovation in the marketplace (Martin 2009).

According to the IBM 2010 Global CEO Study (2010), the capacity to exemplify creative leadership is one of the most important attributes for success in a complex business. Of the 700 chief human resource officers (CHRO) interviewed for the IBM Global Chief Human Resource Officer Study in 2010, 69% claim they are not successful in the development of future business leaders (Barrientos 2011: 11). In addition, 78% of these executives said they are not successful in building and supporting collaboration as well as knowledge sharing in their organisations (Barrientos 2011: 3).

Sternberg (1991: 2) built on this perspective when he noted the following:

> Creative individuals, by their nature, tend to defy the crowd. They resist merely thinking or doing what others are thinking or doing. Rather, they tend to go off in their own direction, seeking to propose ideas that are both novel and useful in some way. The greatest obstacle to creativity, therefore, often is not exactly strictures from others, but rather the limitations one places on one's own thinking. Such limitations, however, may derive from processes of enculturation

and socialization, so that it often is not clear whether restrictions on creativity are internal or, down the line, externally imposed.

Furthermore, O'Hara and Sternberg (2000) noted that creativity is largely a decision, according to the investment theory. As such, the idea of creativity as a decision further implies that creativity can be developed. Requesting students be more creative can empower them if they believe that the actual choice to be and act creative will be rewarded and not be seen as a negative. Mueller said that creativity requires certain conditions to flourish, stating that 'every theorist that exists today on the planet will tell you creativity is an ability that ranges in the population, and I think in a given context, creativity can be shut off—or turned on, if the environment supports creativity' (as cited in Wharton School 2014). Moreover, Sternberg (2006) noted that creativity is a decision that people make based on a set of attitudes towards life. It is this decision towards life that frames a willingness to 'go their own way'. Examples, according to Sternberg (n.d.), of such attitudes towards life are a willingness to do the following:

- Redefine problems in novel ways
- Take sensible risks
- 'Sell' ideas that others might not initially accept,
- Persevere in the face of obstacles
- Examine whether their own preconceptions are interfering with their creative process.

Aspects of creativity, according to Sternberg (n.d.), need a confluence of the following: '(a) abilities, (b) knowledge, (c) styles of thinking, (d) personality attributes, (e) motivation, and especially intrinsic motivation, and (f) environment'. Additionally, Sternberg (n.d.) contended that an individual 'can have the creative ability that would

allow for creativity, for example, but without a willingness to take sensible risks or an environment that provides at least minimal support for creativity, that individual's potential creativity may be suppressed'. As such, it is critical, especially in an academic setting, to provide an environment that allows for creativity to thrive through action. Also, 'an individual can have a creative attitude but without the skills of creativity—such as looking for reconciliation of opposing ideas and dialectical thinking—may not reach his or her full creative potential' (Sternberg n.d.).

Knowing that these attitudes are teachable, according to Sternberg (1999), what happens to our creative capacity and confidence as we grow up? As Kelley and Kelley (2013) noted, we all begin with the ability to be creative, and over time, various events can either bolster that confidence to act creatively or diminish it to the point that we give up on creative endeavours altogether. According to the same source, whether or not we exercise creative confidence is the sum of the environments and experiences (good and bad) that we are a part of throughout our lives. The authors' research demostrates that a lack of confidence in our creative abilities can come in a single moment or build over time. For example, maybe a student is told that something he or she created is bad. In this moment, the student has to decide whether to try again or to write his or her self off as being uncreative. This criticism can come from a peer, or even worse, from a teacher and can crush a student's confidence in one fell swoop. Students can also lose confidence in their creativity over time: Because the current educational system focuses heavily on results and on getting the correct answer, this type of learning teaches students that there is one right way to solve a problem, and over time, students can begin to focus on learning how to get the right answer instead of learning how to solve a

problem (Kelley and Kelley 2013). According to the authors, this narrow focus can also come from the social pressures insisting that artistic or creative endeavours do not lead to good jobs once school is finished. Robinson (2006) addressed this issue in his TED talk entitled *Do Schools Kill Creativity?* He says that the current education systems teach students that mistakes are unforgivable. In its current state, students' sense of self-discovery and motivation to learn are stifled. This is counter to the purpose of the education system, which is tasked with providing students with a space to discover their natural talents and abilities, to hone them, and to learn how to apply them as students prepare to navigate the world beyond school.

Beyond failed attempts at creativity and a stifling educational system, there exists a social proclivity towards separating people into two groups, according to Robinson (2006): those who are creative (writers, artists, designers, etc.), and those who are not creative (accountants, business people, etc.). This social pressure begins early on when people who are gifted in technical skills such as math and science become so associated with these areas of study that they begin to move away from more traditionally creative topics such as art and design. This stigma towards associating with either the creative side or analytical side often divides people between opposing sets of interests and forces them to choose one over the other. The author sees this first-hand teaching in both a design institute and a business school.

In the author's experience, this association with a technical skill set exists as students continue through college and into career fields; indeed, any who are skilled in math and science become scientists or engineers of various types working on solving deeply

analytical problems. Furthermore, according to Brown and Katz (2009), Kelley and Kelley (2013), and Martin (2009), because of this further specialisation into technical fields during college, upon graduation, students find their way into technical jobs in which they are not expected to be creative. People with technical backgrounds become the 'technical people' while those with creative backgrounds become the 'creative people'. And according to Martin (2009), individuals are not expected to contribute outside of their area of expertise and as such, companies miss out on loads of valuable input that can be realised at the intersections of domains such as design and business. Additionally, Martin (2009) observed that because creativity is not often expected or encouraged from people in technical and/or business positions, sharing valuable ideas often becomes difficult and intimidating. He also noted that people who have not been trained in creative backgrounds find it extremely difficult to share an idea that they might have, simply because they might not be able to express it as well as someone with confidence in their creative abilities. According to Kelley and Kelley (2013), this stifling social pressure, paired with people's own opinion of their level of creativity, causes many great minds to go unutilised.

It then becomes vital to encourage and foster creativity within the education. According to Brown and Katz (2009), failures should be celebrated and learned from so that individuals develop what Dweck (2007) referred to as the 'growth mindset'. This mindset is the belief that 'a person's true potential is unknown (and unknowable); that it's impossible to foresee what can be accomplished with years of passion, toil, and training' (Dweck 2007: 30). A person needs to have the confidence to try something new that he or she might initially be terrible at—knowing that they can and will be able

to improve over time. Dweck further explained that ‘an experiment ending in failure is not a failed experiment, as long as constructive learning is gained’ (2007: 41). We all must understand that we will not be good at everything on our first attempt, but also that we can never be great at anything without first trying it.

Fortunately, creative confidence can be regained even if it has been lost over the years. Kelley and Kelley (2013) contended that the courage to take the first step is critical. Whether it is pursuing an idea, or making a change at work, they are proponents of the ‘do something’ mentality: ‘The first step toward being creative’, they wrote, ‘is often simply to go beyond being a passive observer and to translate thoughts into deeds’ (Kelley and Kelley 2013: 118). This notion is further supported by Sternberg (1991: 76), who stated that ‘deciding for creativity does not guarantee that creativity will emerge, but without the decision, it certainly will not’.

So what does creativity mean for business? Oftentimes, in industry, there exists a divide between people who are expected to be creative and those who are not (Martin 2009). According to Martin (2009), business decisions are left to the executives, engineering to the engineers, and design to the designers. Martin (2009) further explained that when people are limited to what they are expected and required to do, the innovative power that lies within every member of an organization is also limited.

According to Kelley and Kelley (2013), within organisations where executives believe in creative confidence, everyone who works beneath them can feel secure in sharing ideas that might be outside of their expertise. This allows ideas to come from unlikely

places—places that oftentimes contain the richest opportunities for innovation. People who are working on the front lines of the company often have a deeper understanding of the needs of the customer and also, the needs of their fellow employees. This can lead to game-changing insights within corporations that might go unnoticed if these employees did not feel it within their role to propose innovative ideas. According to Nussbaum (2013: 77), 'Being creative is not about starting from scratch or being the sole originator of a brilliant idea—it's about adding what you can, making a creative contribution'. Furthermore, he contended that companies all around the world are seeing the power that creative thinking and customer interactions can bring to their business and are moving more and more towards creative design thinking principles.

Kelley and Kelley (2013) argued that within organisations that do not foster creativity in all employees, it can be challenging for people to take steps towards exciting opportunities because it is not expected of them. A culture that places each employee and each group into their proper position and/or role within the organisation misses out on the richness that takes place when cross-functional teams work together to tackle problems. Nussbaum (2013) noted that when an individual or a group of people in an organisation chooses to pursue creativity outside of their normal organisational or educational confines, the results can be powerful. As such, creative leadership through action can enable everything from products, processes, and business model innovation.

2.2.3 Design in Innovation

An argument could be made that the central purpose of design is to be a catalyst for innovation. According to Ruggles (2002 cited in Kaikobad et al. 2015: 35), 'Innovation

drives value, and is one of the most significant attributes investors use to judge business value', while Hamel (2000: 10) added that 'the importance of design cannot be underestimated as innovation and nonlinear ideas create new wealth'. Rusk (2003) further held that design acts as the catalyst for creative thinking and innovation. Duma (1994 cited in Kaikobad et al. 2015: 34-35) refers to the *Oxford English Dictionary* to establish that the innovation process itself often includes design:

> [T]he word 'innovate' comes from the Latin *innovare*, to renew or alter, or as the *Oxford English Dictionary* has it, 'to make changes in something established'. The word 'design' in the same dictionary as 'a plan or scheme conceived in the mind of something to be done, the conception of an idea that is to be carried into effect by action'.

Therefore, design and innovation are often seen as connected processes, which may possibly encourage and inform design differentiation. According to Steinberg (2010), not only does design give form to products, processes, and systems, it also gives form to decision-making itself.

Hansen and Andreasen (2006: 32) stated the following:

> As a consequence of the Global markets' demand for innovation, industrial companies needed employees with well-articulated innovation competencies. Conceptualization may be seen as the core activity of innovation: the concept is the new idea, the new initiative, the new organizing, or the new approach, which carry innovation.

With respect to what innovators actually do as per design thinking, Rusk (2016: 188), noted the following: 'At the core of this inquiry has been the pursuit of new ways of

thinking to generate new ideas, release new energies and new possibilities'. It cannot be overstated enough that innovation is fundamental to leading organisations' successes (Collins and Porras 1994), and because disruptive ideas can create new value, the impact of design cannot be undervalued (Hamel 2000). Ruggles (2002) further suggested that innovation is the driver towards business value and is an important attribute investors use to evaluate an organisation's value. With this perspective in mind, 'a purpose of design is innovation' (Walton 1995 cited in Kaikobad et al. 2015: 35).

As such, the scope of innovation includes a context for design, and how design is supported and executed is a responsibility of management in order to best facilitate innovation (Faste 1995). Faste also noted that managers within design are distinctive in that they are involved in both invention and innovation. Furthermore, innovation involves the implementation and adoption of an invention. In many organisations, there is often a gap between a business's ability to recognise the critical nature of innovation and the development of a strategy for enabling innovation within a culture (Turner 2009).

Hansen and Andreasen (2006: 39) argued the importance of design within the culture of innovation, stating it thusly:

> Human beings have intentions, where explicit formulations support deliberation in arriving at a consensus. On one side design team members need to know many types of solutions elements, different ways to realise goals and solutions, and have insight into uncovered needs and potential market opportunities. On

the other side open minds might help, i.e. to question the existing and identify new start points and approaches for innovation.

According to Chen and Kai-ling Ho (2002), both consultants at Cap Gemini Ernst & Young Center for Business Innovation, statistical analysis shows that innovation is regarded highly as a driver of corporate value. It is also often regarded as an intangible. Similarly, Low and Kalafut (2002) suggested that innovation can be an advantage to the company that is not always visible. Additionally, product design innovation is not sufficient, on its own, to position a company as a market leader.

Furthermore, design and innovation, according to Brown (2008), can also be reframed as design and change. Design, by its very nature, can be viewed as change through its orientation towards what is possible. As such, design and innovation are enablers of change for business. Flavin and Yamashita (2002) argued that change is a holistic activity and thoughtfully considered. Furthermore, they claim that design can be a method to sharpen the focus of an innovation. This focus is done through facilitation. With that said, Alben (2002) dissected the many components of change and presented a methodology, which exploits design as an important driver for sharing new thinking and perceptions that drive innovation. As such, according to Collins and Porras (1994), innovation is a critical driver for visionary business success.

2.2.4 Design Thinking

Design thinking, for all intents and purposes, involves a blending of thinking processes that use various forms of intelligence that may be considered a designerly way of knowing and doing. And while multiple models on design thinking do indeed exist,

there is no doubt, as Efeoglu et al. (2013) contended, that there is a focus on ‘human-centricity’, which starts with achieving empathy with users and prototyping potential solution-oriented outcomes. Junginger and Faust (2016: 15) argued that ‘design thinking focuses on a human-centered approach, which combines design activities with research on human beings, and technological in business aspects, in order to create knowledge, solve problems, and to innovate’. According to Brown (2008), design thinking rigorously looks to understand the true problem behind the perceived problem and frame opportunities built around human-centric and/or empathic value. Design thinking is not limited to a particular domain: It is innovative, human-centred, creative-oriented, possibility-based, and focused on reframing problems into opportunities for new value creation (Brown 2008).

Thomas Lockwood (2010 cited in Miettinen, Valtonen, and Markuksela 2014: 26), the former president of the Design Management Institute offers this thorough definition of design thinking: ‘A human-centered innovation process that emphasizes observation, fast learning, visualization of ideas, rapid concept prototyping, and concurrent business analysis’. Brown (2008: 86) stated that design thinking is ‘a discipline that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity’.

Buchannan (2016: 17) actually argued that not only is design often ambiguous but so is the term ‘design thinking’, further contending that there are at least four different definition variations:

1. Design thinking is a cognitive process related to processing and decision making.
2. Design thinking is an act of imagination and creativity.
3. Design thinking is a spirit of innovation and culture in which some individuals participate and in which some organizations rise through shared values and creative passion.
4. Design thinking is a discipline of mind in forethought; a practice that can be taught, and it can become a habit for the most gifted and dedicated individuals.

Further supporting this complex nature that is inherent to design thinking, Tovey (2016: 59) said the following about the blending of thinking:

> [D]esign can be seen as a mixture of creativity and analysis. It is not one way of thinking but several, mixing rational, analytical thinking and creativity. This inherent schizophrenia is a defining characteristic of design and directly leads to the peculiar way of working that is a common trait of practice throughout the design professions.

Tovey (2016) further argued that design is built upon a dual processing model (see Figure 2), in which the interaction of the two halves of the brain stimulate and modify each other.

Howard Gardner's (1983) argument for multiple intelligences further supports this dual processing position that designers use in the design thinking process. As such, this model assumes that the two halves of the brain will both be actively working to solve the problem at hand, with each half working with its preferred mode of processing and language. The design process is only successful when these two halves are in

agreement. Furthermore, he argued that in order to effectively practise design thinking, you must allow these parallel activities of analytics and creativity to work together.

Figure 2. Dual-Processing Model of the Design Process

(Tovey 2016: 56)

Tovey (2016: 59) said the following about ability: ‘The ability to think along parallel lines, deliberately maintain a sense of ambiguity and uncertainty and not to get too concerned with a single answer too quickly seem to be essential design skills’. The right balance of thinking is critical, and designers are tasked with the reconciliation of these two views (Schön 1991). Tovey (2016) further explained that there must be a balance between being analytical and being creative. When working on a design problem, being too analytical—too problem-focused—can limit or even prohibit possible creative solutions; however, being too creative—too solution-focused—can lead a designer spiralling into realms of nothingness void of the necessary tether that analytical thinking provides. However, it is this complexity of thought that is fundamental to design thinking, as the very nature of design thinking is inclusive and in fact thrives on collaborative inputs.

In the author’s experience, the accumulation of information from diverse touch-points is critical in order for design thinking to succeed in a rapidly globally connected and networked society. For example, the author has observed that today, the rapid development of technologies, coupled with societal, economic, and environmental complexities, have enabled design to play a more significant role in problem-solving rather than simply product beautification and development. Pine and Gilmore (2011) further supported this when they noted that we are moving from that of a post-industrial service economy and towards an experience-based economy. This shifting need state lends itself to a more user-centred problem-solving approach. Design thinking, with its emphasis on the user, has the opportunity to further shape user experiences that are critical to our economy.

The emergence of design thinking and the positioning of the strategic use of its methodology could be seen as a potential opportunity for a paradigm shift, which challenges the fundamental practices of business (Martin 2009). Martin contended that this shift moves design as a practice of the artful creation in the development of tangible products to one that is positioned to solve complex problems associated with the growing complexity that the world of business now faces. In this way, design thinking has the opportunity to act independently from the traditional discipline of design, and as such, be practised next to other non-designerly design thinkers in the context of business (Martin 2009).

And yet, while design thinking enables us to see differently, it can also be seen as a novelty. This is captured by Dorst (2015: 143), who stated the following:

> The core paradox of innovation management lies in the fact that the ideal image of an organization still is that overly well-oil machine where efficiency reigns supreme. The need to create a novelty is at odds with this model, as novelty inevitably disturbs existing processes.

2.2.5 The Role of Empathy in Design Thinking

Pine and Gilmore (1999) argued that we are moving towards an experience-based economy from that of a post-industrial service economy. This lends itself to the need for a greater understanding of the need state of users and heightens the role of empathy as a driver for innovation. This understanding is further supported by Szasz (2016), who noted that empathy helps to frame new knowledge from people, which is fundamental to solving problems in the service of innovation.

Kouprie and Sleeswijk Vissor (2009) noted that empathy is a quality of the design thinking process and that designers can be influenced by such. It can then be said, they argue, that empathy is a fundamental quality needed in the development of more robust and meaningful solutions for users. They further contended that the notion of the empathic quality of design relates to the idea of designers going through a series of activities in order to imagine what it would feel like to be in the user's position. They articulated this position through a four-step framework derived from issues associated with psychology that can be applied to design thinking. This framework integrates both affective resonance and cognitive reasoning: 'It is based on the principle that a designer steps into the life of the user, wanders around for a while and then steps out of the life of the user with a deeper understanding of this user' (Kouprie and Sleeswijk Vissor 2009: 444). These phases are listed in detail below:

1. Discovery (entering the user's world and achieving willingness)—Within the discovery phase, Kouprie and Sleeswijk Vissor (2009: 445) stated the following:

> The process starts with the designer approaching the user. He makes a first contact with the user, either in person or by studying provoking material from user studies. The designer's curiosity is raised, resulting in his/her willingness to explore and discover the user, his/her situation and experience.

2. Immersion (exploring the user's world and taking the user's point of view)—Within the immersion phase, Kouprie and Sleeswijk Vissor (2009: 445) stated the following:

> After the first encounter with the user's experience, the designer takes an active role by leaving the design office and wandering around in the user's world (data from qualitative user research). The designer expands his knowledge about the

> user and is surprised by various aspects that influence the user's experience. The designer is open-minded, interested in the user's point of reference. He is being pulled into the user's world, and absorbs without judging.

3. Connection (resonating with the user emotionally while finding meaning)—Within the connection phase, Kouprie and Sleeswijk Vissor (2009: 445) stated the following:

> In this phase, the designer connects with the user by recalling explicitly upon his own memories and experiences in order to reflect and be able to create an understanding. He makes a connection on an emotional level with the user by recalling his own feelings and resonates with the user's experience. At this phase both affective and cognitive components are important; the affective to understand feelings, the cognitive to understand meanings.

4. Detachment (leaving the user's world and design with the user's perspective)—Within the detachment phase, Kouprie and Sleeswijk Visser (2009: 445) stated the following:

> The designer detaches from his emotional connection in order to become 'in the helpful mode' with increased understanding. The designer steps back into the role of designer and makes sense of the user's world. By stepping back out to reflect, he can deploy the new insights for ideation.

In each of the four phases, the relation of the designer with the user changes and empathy can be enhanced. Kouprie and Sleeswijk Visser (2009) further noted that by using this framework, the designer has greater knowledge of the user, and in turn, better decisions can be made with respect to meeting the needs of the user.

As such, empathic understanding goes beyond knowledge. Empathic design allows one to relate to people and to have a clearer understanding of what is meaningful to people. Not only is empathy a quality of the design process, but empathy can be considered as an ability people have, which can be different from person to person. McDonagh (2006 cited in Kouprie and Sleeswijk Visser 2009: 439) defined empathy as 'the intuitive ability to identify with other people's thoughts and feelings—their motivations, emotional and mental models, values, priorities, preferences, and inner conflicts'. While ability is critical, the willingness to be empathic is fundamental. Battarbee (2004 cited in Kouprie and Sleeswijk Visser 2009: 439) further stated, 'Design empathy requires direct and personal engagement and is dependent on the designer's willingness'. With a designer's willingness critical to gaining empathy, Kouprie and Sleeswijk Visser (2009: 447) further defined three key elements of empathy that design thinkers need to be mindful of:

1. Empathy provides a foundation for motivation with respect to the designer's drive to create more meaningful solutions.
2. There is a need to combine both affective resonance and cognitive reasoning regarding the user's life in order to fully realise empathy. Also, the designer will need to both experience and reflect on the given user circumstance in order to effectively design with empathy in mind.
3. A process of understanding and gaining empathy for the user within the design thinking process is time intensive.

Design thinkers must be not only willing but mindful of empathy because, as Liedtka (2014) argued, it is human nature to project one's own worldviews on situations, potentially making one blind to solutions outside of those early solutions that they seek,

solutions they have become overly invested in. Phases of empathy have been distinguished by different authors (see Table 4).

Table 4. Phases of Empathy

(Kouprie and Sleeswijk Visser 2009: 444)

Phases of empathy distinguished by different authors:

PHASE 1	PHASE 2 A	PHASE 2 B	PHASE 3	AUTHORS
Emergence of the Experience: Perceiving a past experience of someone else.	**Fulfilling Explications:** Getting pulled into the experience, standing next to the person facing the object of his emotion.		**Comprehensive Objectification:** Withdrawing from the other's experience, with increased understanding.	Stein, E. (1917)
Identification: Paying attention to another and allowing oneself to become absorbed in contemplation of that person.	**Incorporation:** Making the other's experience one's own via interalizing the other.	**Reverberation:** Experiencing the other's experience while simultaneously attending to one's own cognitive and affective associa-tions to that experience.	**Detachment:** Moving back from the merged inner relationship to a position of seprate identity.	Reik, T. (1949)
Entering: Entering the world of someone else, becoming at home and being sensitive to what someone is experiencing.	**Living:** Temporary living someone's life; sensing the other's world with fresh eyes, not making any judgements.		**Communicating:** Communicating your senses to the other, checking if your senses are correct, being guided by the other's responses.	Rogers, C. (1975)

As noted in the chart, Stein, Reik, and Rogers (cited in Kouprie and Sleeswijk Visser 2009: 444) described the actions of an empathiser as coming in and out of the empathee's life. While in between, the empathiser explores the empathee's life. The coming into is required for deeper understanding of the user, while the coming out is required for reflection. As such, both qualities of understanding and reflection are

critical for design thinkers in the early phases of the creative process as they seek original new knowledge to further support later stages in the process. Starkey and Tempest (2009: 584) stated that 'empathy actually improves the likelihood of making decisions that will have long-term positive outcomes for the maximum number of stakeholders involved', and it is through an empathic framework that creative possibilities arise and thus a richer more fulfiling decision space, full of options, occurs.

2.2.6 Design Thinking and Strategy

According to Rusk (2016), leadership and management theory are grounded in military strategy and business curriculums, and practices have become rooted in rational and analytical science based on what is measurable. As such, business strategy, according to Rusk (2016), is rigid and can often lead to predictable outcomes that are less inspiring and far less innovative. They often emphasise resource and production operations as well as marketing and total quality control. However, this is not a new phenomenon, as according to Friedmann (1973 cited in Rusk 2016: 185), 'It may no longer be possible to plan future strategies effectively, given the changing nature of the economy, the political landscape, and the speed at which these changes occur'. Rusk (2016: 185) stated, 'We live in the world of quantum physics, yet we still largely employ approaches to management that were formulated in the 1950s for the 1950s'.

According to Brown (2008), with the never-ending and complicated need for competitive advantage, traditional hierarchical ways of business strategy need to become more flexible. Flexibility takes the form of both evolution and adaption and seeks to utilise more open system networks for inspiration. As such, inspiration also

requires a deep understanding of the nature of creativity and how it can be realised through the design thinking process. Rusk (2016: 186) supported this when he stated, ‘In a world that is so unpredictable and complex, we no longer have a choice but to improvise, evolve, and innovate. Consequently, collaborative approaches are becoming critical to addressing current and future big problems’.

Handy (1989) built on this argument when he explained that stagnant thinking creates stagnant results; whereas, innovative requires unconventional, creative, and even unreasonable thinking to generate transformational approaches. Ultimately, nothing changes if our thinking does not change. Moss Kanter (1997) explained that it is challenging to turn an organisation around to incorporate innovative imaginations and creative collaboration, even though that organisation already knows and recognises that creativity and innovation are essential to the organisation’s performance and strategy. Once the organisation can meet that challenge, they become adept to change necessary to growth and success through innovation. As such, there is an increasing acknowledgment that design thinking, and/or the creative mindset and methods that have been historically connected with the functionality of design, may now offer business a new set of tools to apply more broadly to management and strategy. According to Roger Martin, ‘We are on the cusp of a design revolution in business…today’s business people don’t just need to understand designers better. They need to become designers’ (cited in Dunne and Martin 2006: 513).

Rusk (2016: 190) advocated that management make three key criteria explicit for design to play a strategic role in business:

- Design needs to have a central role in the strategy of evolving ecosystems.
- Design needs to facilitate ‘big picture’ understanding of multifaceted problems.
- Design needs to generate alternatives and provide integrated alternatives in different circumstances.

Martin (cited in Dunne and Martin 2006) supported this when he noted that business strategy is often associated with a reliable process that produces predictable results and is deeply rooted in optimizing value through the exploitation of existing knowledge. However, designers work within a process that is rooted in validity, seeking new knowledge through deep exploration of qualitative understanding of users, which can often be unpredictable. This leads designers to concepts that they may have conviction for but cannot necessarily prove. In most reliability-oriented business cultures, constraints are often viewed as problematic. However, in most validity-oriented business cultures, constraints are often seen as possibility-based opportunities for innovation. Other aspects of a reliability-based business that may also prove to be a barrier to innovation include, according to Leavy (2010), the great numbers of leaders educated in analytical thinking, including graduates of most business schools.

Furthermore, Martin (2009: 122) contended that ‘in most organizations, two central processes, financial planning and the rewards systems, tend to be dramatically tilted towards running an existing heuristic or algorithm and need to be modified in significant ways to create a better balance’. He argued further that organisations must recognise their built-in biases and preferences for strictly analytical thinking if they want to develop in design thinking. To do that, they must also take innovative risks to rely more on validity and less on reliability. According to Martin (2009), the business

world has a historical bias for reliability because the factors that bring about reliability are familiar and comfortable to business people.

However, Fraser (2007) contended that design can be a catalyst for growth—with the aim being to create new economic and human value. This builds on the idea that when something is good for the user, it is also good for the entire system. She noted that a truly innovation-driven organisation asks three key strategic questions at every opportunity it encounters, which drive breakthrough business strategies.

Those key strategic questions are:

- ‘What is the need driving this initiative?’
- ‘Have we pushed out on the possibilities to best serve that need?’
- ‘How can we embed that into our business model to create a sustainable advantage?’ (Fraser 2007: 73)

Liedtka and Ogilvie (2011) also saw design as a mindset and toolkit for problem-solving and leadership in the business world. However, Liedtka and Ogilvie (2011) contended that business education is founded on an analytics-first mindset, reinforced and rewarded through historical proof points. Furthermore, Liedtka and Ogilvie (2011) framed this perspective as potentially more effective for process improvement, but less effective for innovation strategy and the creation of new value. The result is often meaningless products and services as well as incremental growth. The business mindset often sees every problem as a problem, while the designer mindset views problems as possibility: ‘Design is tailored to dealing with uncertainty, and business’s obsession with analysis is best suited for a stable and predictable world’ (Liedtka and Ogilvie 2011: 14).

Furthermore, the authors advocated that when crafting strategy, business leaders need to think and do as if they were designers. As such, they need to go into the field and earn empathy; authentically understand, support, and enable invention to occur; and embrace failing forward, while also utilizing and celebrating the iteration of ideas.

Liedtka and Ogilvie (2011: 17) held the following:

> The future will require multiple tools in the managerial tool kit—a design suite especially tailored to starting up and growing businesses in an uncertain world, and an analytic one suited to running established businesses in a more stable one— not two opposing sets wielded by warring groups of people who can't communicate with each other.

Liedtka and Ogilvie (2011) also argued that the world of business is process-oriented and so actually is the world of design. Furthermore, they contend, process is critical to driving strategy. Process also suggests that one is doing something; however, business leaders often focus on the implied higher value of thinking. They further suggest that this approach is counter to the design innovation process, which utilises thinking and doing, and claim that thinking and doing cannot be separated. The authors' work frames the design around four very basic questions, which correspond to the four stages of the process (Liedtka and Ogilvie 2011: 21):

- 'What is?—explores current reality'
- 'What if? —envisions a new future'
- 'What wows?—makes some choices'
- 'What works?—goes into the marketplace'

Furthermore, Fraser (2007: 67) built on this notion when he stated that ‘by embracing design methods and mindsets, an enterprise can not only design new products, services and experiences, they can also fundamentally drive the design of economics in support of dramatic new growth strategies’. Fraser (2007) defined an iterative nonlinear strategic model for business innovation as the ‘three gears of design’ that drive strategy and business design:

First Gear—Reframe your business through the eyes of the user: Fraser (2007: 68) explained ‘first gear’ in the following way:

> To broaden the lens, it is important to look beyond the direct use of the company’s product or service and explore the activities surrounding it to gain deeper insight any broader behavioral and psychographic perspective on the user’s life. It is also critical to understand the whole person in the context of a given activity—not just what they do, but how they feel and how their needs surrounding the activity link to other parts of their life in terms of other activities, other people, and other cues to their needs.

Second Gear—Activate creativity through user empathy: Empathy can bring a set of broader opportunity criteria, which can frame and/or reframe innovation opportunities. With deeper empathy, the generation of possibilities with respect to meeting human-centered needs in a more thoughtful way, help inform broader opportunities before settling on a defined strategy. Fraser (2007: 70) supported this, stating, ‘by using consumer needs as a point of departure to explore multiple solutions, one can generate a

wide range of possibilities outside one's current repertoire of solutions and business framework to expand horizons'.

Third Gear—Align strategic concepts with future realities: It is within this gear that the feasibility and viability of concepts are explored and further defined, setting the stage for determining the strategies and capabilities required for realisation. Fraser (2007: 72) further supported this by stating the following:

> Through this iterative process, prototyping (first on the conceptual solution, then on the strategic business model) and constant assessment of user value (based on the identified user needs and considerations) along with the potential to create sustainable competitive advantage for the enterprise, one can formulate a strategy for a new level of innovation and competitive advantage. By challenging the current model and exploring new ways to drive success, one can find the strategic and operational point of sustainable equilibrium.

However, Fraser (2007) contended that this methodological framework can only be a successful contributor to business strategy if the right mindset and conditions that allow design thinking to flourish are in place in the business. Open-minded collaboration is critical with respect to the acceptance of new insights as well as disruptive ideas that might not fit the assumed paradigm. Secondly, the business needs to empower the exploration of new ideas based on user insights, which allow for exploration beyond the probable state to future state. Lastly, the business needs to recognise and support that this framework is not linear and that iteration is important throughout the process. Finally, there needs to be a willingness to challenge constraints. As such, this design-centric approach to strategy has the capacity to potentially create new knowledge and as

such, new business value. This is further supported by Handy (1989: 10) when he stated, ‘If we change our attitudes, our habits and the ways of some of our organizations, it can be an age of new discovery, new enlightenment in new freedom, an age of true learning’.

Fraser (2007: 73) stated the following about business model strategy concerning the user:

> Good strategy involves making choices. Great strategy includes not making compromising trade-offs. Those that find ways to create new models instead of making unacceptable trade-offs find themselves ahead of the game. The design method can help in resolving model conflicts—keeping the user at the center and prototyping various ‘what if’ strategic business models to ultimately deliver value to the user and viability, operationally and economically.

As such, collaboration across a wider set of stakeholders in the business value chain is necessary to deliver more meaningful and sustainable ideas. Business strategy will require new framing models and greater stakeholder engagement as fundamental to the way entrepreneurs, business leaders, designers, engineers, and researchers innovate. Bocken, Rana, and Short (2015) contended that decision-making within business strategy revolves around judgments placed on value and ethical-based considerations. Furthermore, they claimed that social, economic, and ethical understanding could be utilised to inform these value judgments while also utilising a wide variety of forms, including human needs, well-being, and cultural values—all of which inform empathy within the design thinking process, and all of which have a direct impact on business strategy.

2.3 Design and Business

2.3.1 The Business Gap for Design

Design as a platform for problem-solving can help modern organisations solve complex problems, find new opportunities, innovate, and grow. Gardien and Gilsing (2013) contended that design has evolved from simply a service provider within an organisation to an integrated core business function that emphasises collaboration. According to Roscam, Abbing, and Zwamborn (2012), design can serve a primary role in solving problems and can lead us into a more prosperous future. However, this view is not universally held. Dorst (2015: 45) explained why many see design as irrational—because it is open-ended process to problem-solving that always has more than one solution. Without a single, logical solution reached through a clear, analytical process, design can seem to lack rationality. In design, solutions are not reached in the same way solutions are reached in mathematical processes, where absolute truths are sought in an abstract world. Design inherently seeks multiple solutions applicable in the real world. However, according to Burnette (2016: 104), 'the bridge to real design thinking remains to be crossed by most businesses'.

While both business and design think is process-oriented, as Lockwood (2002) contended, business education is fundamentally based on a perspective that is analytics oriented and is supported and rewarded through evidence founded in historical data. This supports Dorst's (2015) argument that problem-solving efforts are constructed by solution-type as opposed to problem-type due to the nature of our professional and cultural biases. Liedtka and Ogilvie (2011) framed this as an effective process improvement perspective over that of a new value creation perspective . The business

analytics-first perspective is not tailored to exploring uncertainty, and this is not stressed in business education. Liedtka and Ogilvie (2011: 10) contended that the 'obvious differences in framing, data-gathering approaches, and project output speak of more fundamental differences in the core assumptions and decision drivers underlying each approach'. Design thinking requires understanding the human experience as its decision driver, while business thinking is based on rationality and the notion of objectivity. Despite the striking differences, Liedtka and Ogilvie (2011) contended that a more integrated relationship needs to work in order to achieve anything worthwhile in a complex and competitive new marketplace; according to Liedtka and Ogilvie (2011: 14), 'design is tailored to dealing with uncertainty, and business's obsession with analysis is best suited for a stable and predictable world'.

As such, business can longer be practised as it has been. Boland Jr. and Collopy (2004: 7) contended that business enterprise is 'in a difficult situation', as the probability-based model of a business practice is no longer sustainable in a world that demands innovation now more than ever. They further noted that traditional business tools are ill-suited for the work of complexity, uncertainty, and innovation. As such, they can only provide business with a limited pathway forward at best.

As Drucker (1986) noted, the primary function of business leadership is to make certain the economic performance of the business. However, business leadership needs to lead. Bennis (1997) noted the difference between a manager and a leader is status quo. Managers are more often accepting of the status quo as opposed to actual leaders, who are not. Thus, leaders are driven to always be improving. This is additionally important

for business and the role of design thinking because, according to Johnson (1998) and Senge (1999), not only do business conditions change, they are ever-changing. If they are not changing, then they are not innovating, evolving, and staying relevant. Hamel (2000), Hamel and Prahalad (1994), and Kotter (2001) argued that what business leaders actually do is prepare organisations for change and support them, as the organisations will most likely struggle through it. However, management's objective, according to Lockwood (2002), is often tactical and less innovation-oriented, focusing on evaluation reviews and improvements while also connecting strategy to fundamental business needs. As such, organisations generally have well established structures and rewards systems, rooted in probability, driven by a prescriptive decision-making process with highly calculated risk adverse actions. Dorst (2015: 143) supported this when he said the following:

> The core paradox of innovation management lies in the fact that the ideal image of an organization still is that overly well-oiled machine where efficiency reigns supreme. The need to create a novelty is at odds with this model, as novelty inevitably disturbs existing processes.

Dorst (2015: 136) explained that our over-reliance on rationality as the foundation of all 'critical discussion and successful action' has become so embedded in our culture that we feel the need to apply a clear and rational explanation to everything we think or do. Thus, as business values—and in many cases requires—stability and control, with a focus on analytical approaches and proof, design values experimentation and is comfortable with uncertainty and ambiguity, with a focus on doing and iterating. Needless to say, these values directly reflect the differences and tensions that exist between the two. Liedtka and Ogilvie (2011: 14) argued that 'design teaches us to let go

and allow more chaos into our lives; designers lean into uncertainty, while managers often deny or fight it'.

As such, there is a significant opportunity gap for design thinking to be embraced and practised throughout the business enterprise. Furthermore, according to Lockwood (2002), current education strategies produce a knowledge gap and a communication gap between the two fields. First and foremost, design in and of itself cannot win the day alone. Secondly, businesses that are led from the perspective of data only will miss real opportunities to create, execute, and scale meaning innovations. Liedtka and Ogilvie (2011: 10) stated the following:

> Building a better future together starts with understanding the depth of differences in how we see the world. Designers need to understand the fear they engender: Almost everything about them makes traditional managers uncomfortable. And then make things worse by chasing novelty for its own sake.

Junginger and Faust (2016) posed several questions that business face today, based on a lack of design understanding in the business world. They are as follows:

- How should one go about solving a problem when one does not yet know the problem?
- How should one go about making a decision when the criteria for the decision have yet to be understood?
- How do we conceive of radically new forms of business, come up with new business models, envision new products and new services, and identify, discover or generate new resources?

2.3.2 Design and Business School

Students of business are challenged with learning how to solve problems and often default to using familiar linear business processes to address them, placing future business enterprises in a 'difficult situation' with respect to innovation, according to Boland Jr. and Collopy (2004: 7). Furthermore, Glenn et al. (2015) noted that business schools emphasise an analytical approach with a focus on planning and optimisation over the predefined problem area. This analytical methodology is best suited when the problem space is understood in a clear way and when past significant data can be used as an indicator of future experiences or conditions. Design thinking, by contrast, is an approach to tackle uncertainty and complexity (Buchanan 2016). People and their behaviours and motivations are often at the centre of the problem, explains Buchanan, which adds to the level of uncertainty and thus complexity. When faced with unknowns, where historical data does not tell a meaningful human-centred story, and business leaders are looking to create new source opportunities for value, design thinking provides a structured path forward (Buchanan 2016).

According to Liedtka and Ogilvie (2011), business tends to value—and, in many cases, require—stability and control, with a focus on analytical approaches and proof. Design tends to value, and is comfortable with, uncertainty and ambiguity, with a focus on doing and iterating. Needless to say, these values directly reflect the differences and tensions that exist between the two. Liedtka and Ogilvie (2011: 14) further stated, 'Design teaches us to let go and allow more chaos into our lives; designers lean into uncertainty, while managers often deny or fight it'. Despite these complexities,

according to Boland Jr. (2016: 64), design leads us to continuous improvement of the current situation:

> We increasingly live in a world that requires continuous creation of the new, which brings with it the need for a design attitude which is rooted in the assumption that whatever the current situation we can always do better. Not better in a marginal sense of continuous improvement and commitment to more efficiency, but in the transformative sense that managers' responsibilities include reshaping the world they encounter and produce.

Starkey and Tempest (2009: 576) stated, 'The design challenge for business schools today is to critically examine and reshape our intellectual legacy through an imaginative engagement with alternative ways of knowing and being in the world'. Historical design has been viewed by the business world as an implementation tool and not an information tool, clouding the understanding and value of design by business. However, design can actually be viewed and practised as a multi-functional activity that can be used in a variety of ways, and as such, Starkey and Tempest (2009) argued that the new challenge facing business today is to design a more holistic point of view of management and management education. They contended that this can ultimately be realised through increased interaction and collaboration with the arts and humanities in order to remake the business school as a more empathic and creative institution. Furthermore, they noted, there is a need for students of business to open themselves to new ideas and to new possibilities. Davis (2010: 6533) contended that business thinking can greatly benefit from a perspective informed by design thinking because of its ability to inform and shape goods and services that 'produce greater effects for customers'. Davis further noted that in order for design thinking to be fully realised as a business

value creator, the subject must be adopted early on through the teaching of the subject matter in formal academic business institutions.

As such, Buchannan (2016) argued that in order to be impactful, individuals must be able to see past their areas of specialisation and understand how to become more cross-disciplined in support of seeing and acting more holistically. Business schools need to recognise that within the complexity of modern society, business education needs to rethink the notion of management in that it is as much a qualitative art as it is a quantitative science. Starkey and Tempest (2009: 578) argued that the 'business school community has lost their ability to think critically about what they do' and noted that a more holistic approach to business education includes design principals. This is further supported by Martin (2009) when he noted that business education is often focused on what is, while design is often focused on what might be. The case for what is possible is supported by a design mindset that reveals, according to Starkey and Tempest (2009: 580), 'Designers are motivated by a quest for knowledge not for its own sake but by the need to address troublesome problems that challenge existing ways of doing things or by a sense of the opportunities to change something for the better'.

Davis (2010: 6533) argued that a new model for business education should be multifaceted and that it must incorporate creative practices from design thinking, further stating that 'traditional business models have handicapped themselves by buying into false attitudes: that creativity is something one is born with and that creative types have a specific place within the company organization'. Moreover, while students of business may be resistant to creative practices, declaring they are not creative, if 'a person is

willing to learn, there is the potential for creativity to occur through process' (Davis 2010: 6533) and that these preconceived notions must be withdrawn from future business school pedagogy. As such, Davis contended that a business student must expand and exploit the ability to leverage new knowledge through creatively enhancing user consumption and experiences.

According to Triggs (2011), the fundamentals of design thinking—such as empathy, problem framing and reframing, communication, and visualisation—are very elusive skills to business students. The language and the specific tactic of execution all sound, look, and feel different from those skills traditionally advocated for in business schools. Furthermore, design thinking and creativity must be built around process and context. Process is a cornerstone of business practices, and in order to be taken seriously, process must be stressed. Learning the design thinking process and building confidence in practice and advocacy will take time, as design pedagogy and methods textbooks such as Baxter (1995), Cross (2000), and Tovey (2016) put the emphasis on user needs and creative methods in the service of designing something different. However, designing something different does not mean that you have designed something of significance; and often, the contextual situation is vastly more complicated than how it may be framed in books on design and design thinking.

Liedtka and Ogilvie (2011) argued that students of business are confronted with a growing sense of ambiguity as they navigate through complex challenges. Even those students practised in the design thinking process experience moments of doubt and increasing frustration over the ambiguous nature of some challenges. Ambiguity can

create uncomfortable uncertainty as more information is gathered than can be immediately understood. Patience is required as patterns begin to emerge and synthesised data are made actionable. Furthermore, business students with a low acceptance for ambiguity, and who may also have a learning style that focuses on convergence, may struggle to fully embrace the design thinking process. Glen et al. (2015) also noted that design thinking reliance on softer skillsets—such as observation, empathy, and intuition—often leave students of business frustrated at first. According to Welsh and Dehler (2013), business students, who are historically used to and comfortable in structured environments for learning, view the process of design thinking as both uncomfortable and unfocused, often referring to it as fuzzy and/or less rigorous than business-oriented learning.

As such, repetition and practical application will be fundamental to the success of teaching business students design thinking: 'they must do, not just read about it or listen to a drowning lecture' (Davis 2010: 6534). According to Brown (2008), design thinking requires the enabling of multiple cycles of repetitive practice. Davis (2010: 6535) outlined the following perception factors of business students, which contribute to their fear and often the inability to advance the subject of design thinking. They are as follows:

- I am not creative
- There is only one correct answer = I don't want to make the wrong choice
- I am not going to do it right
- I have to do it alone = innovation is an individual project
- Perfection

- I am not good enough, smart enough
- You must follow existing and standard methods of business
- Nothing to offer
- The boss will fire me if I am wrong

Martin (2009) further noted that business schools need to seek a balanced approach to seeing, thinking, and doing that are framed in a way that business-minded thinkers can embrace. He argued that process is the key to the development of knowledge. Furthermore, Fraser (2006) argued for a balance of intuitive qualitative approaches and qualitative approaches in business education, which will better facilitate new learning opportunities. As such, this integration of approaches is lacking today in business education; therefore, a reconfiguration of the approaches that business students are taught is called for—a reconfiguration that is 'more socially engaged by deepening our engagement with the social sciences—with a stronger emphasis on the social—and, particularly, with the arts and humanities to develop an image of management better fit for the purpose of addressing the challenges of the modern world' (Starkey and Tempest 2009: 586).

Liedtka and Ogilvie (2011) noted that the gap in business education will need to develop the intellectual case that supports the balance of inquiry and new ways of doing. It will require cultivating a more open way of understanding and relating to real people, which will lead to a more compassionate capitalism that is informed through empathy. This notion is further supported by Rusk (2016: 191) when she said the following:

> The route to expanding minds is education through inquiry, learning, and practice; for knowing is everything, especially when life is full of paradoxes that need to be balanced. But that acquisition of knowledge also requires incubation, reflection and contemplation, and so at times of disintegration and fragmentation we look for integrative processes. Integrative learning is holistic. It focuses on learning from differences…., and is best achieved in circumstances where diversity is welcomed as a stimulant and where different approaches and perspectives are espoused as complementary.

According to Glen et al. (2015), despite initial perceptions and structure differences from traditional business school teaching, design thinking may provide business students with a repeatable process to undertake complex problem-solving while supporting the facilitation and management of innovation, and a much-needed complement to the analytic approach emphasised throughout business education. Students of business, familiar and comfortable with ordered learning environments, could benefit from experiencing first-hand how the implied messy process of design thinking can produce innovate outcomes. As such, the emphasis of design thinking must be rooted in the notion of process and that the process is repeatable, structured, and also iterative.

According to Kelley and Kelley (2013), business students who engage in design thinking have a creative awaking, experiencing more confidence when in need of developing innovative solutions. Davis (2010: 6535) argued that ‘a defining attribute to a design thinker is their ability to constantly make new connections’ and that the actual process of design thinking enables and promotes that activity. It is these new

connections that lead to more creative and thus innovative solutions; indeed, Handy (1989: 10) averred that by changing ‘our attitudes, our habits and the ways of some of our organizations, it can be an age of new discovery, new enlightenment in new freedom, an age of true learning’. Glen et al. (2015) noted that incorporating design thinking into a business curriculum may enable students of business to better understand and frame unstructured problems through a methodology while also providing them with repeatable processes for managing innovation. Boland Jr. (2016: 65) further stated that the opportunity is for business students to have a more holistic perspective, with the ability ‘to see the need to challenge and reinvent familiar ways of organizing and managing, and more awareness of their larger responsibilities to create value in society’.

2.3.3 Design Thinking and Business Thinking

The worlds of business and design often dismiss each other’s perspective while failing to appreciate that both modes of thinking, while fundamentally different, are rooted in purposeful thought. Burnette (2016: 96) contended that business thinking mostly remains at this lower level of purposeful thought and ‘guided by what is familiar, predictable, productive, and rewarding in the short-term’, while design thinking ‘tends to broaden and reframe the problematic situation, to reconceive it, and find innovative ways to reformulate and resolve the circumstances of concern’, and creative design thinking achieves an even higher level of thought, as it attains ‘extraordinary, inventive, and culturally significant outcomes’. Topalian (2012) noted that design is the unifying discipline that underlies all aspects of business. Furthermore, Topalian (2012) explained that design is involved in every human endeavour that seeks to create effective means towards some desired end. However, according to Topalian (2012), decision making,

and ultimately control, is primarily based upon traditional business practices. Universally, business stays clear of creative perspectives such as design thinking and is sceptical of new ways of understanding and working.

The opportunity for the success of design thinking in business is rooted in integration that leads to new knowledge, and in turn, better decision-making. Roger Martin, a former Dean of the Rotman School of Management at the University of Toronto, contends that business leaders need to become design thinkers in order to create new value and not just simply analyse the past. Buchanan (2016: 17) further supported this when he stated that design needs to move towards 'action, services and management'. Furthermore, Kolo and Merdes (2016: 123) stated that 'innovation is not carried out in a particular department or within a set time frame. It is a free flowing movement that encompasses the whole organization'.

However, the relationship and thus the integration of design and business is one of misunderstanding and lack of clarity of purpose. Design, as suggested by Topalian (2012), is often typecast and forced into organisational silos with an emphasis on design execution rather than value creation with design. According to Topalian (2012), the business world has traditionally left design professionals out of crucial decision-making processes, minimizing their influence by compartmentalizing their work to mere supporting roles, not as drivers of innovative ideas.

Topalian (2012) pointed out that analysis and analytics are often the basis of most MBA curriculums, and as a result, future business leaders often lack the skills to truly

understand the reasoning behind products and/or services that companies provide, and perhaps most importantly, the possible opportunities that lay ahead. Management can lose sight of the true meaning in their products and service and disregard the role of empathy for the 'proven' analytics of the business (Topalian 2012). Additionally, Topalian observed that managers can often hide behind analytics as a way of managing their own person risk, let alone the risk of their team and the organisation as a whole. Dorst (2015: 136) argued the following:

> Rationality is considered the bedrock of critical discussion and successful action. This is a cultural 'given' that runs deep in our veins: we are used to the convention that we must be able to give an account of our thoughts and actions using rational arguments.

Topalian (2012) argued that in order for design to be elevated beyond a commodity service application, leadership must have a broader view of the subject. This broader view would help move the conversation of design as a tactic to design as a leadership approach to problem solving that is more holistic and mindful of all stakeholders. This view, in order to have success, needs to be nurtured throughout the organisation.

So while design thinking feels so foreign to business thinking, and it is simply not fundamental within the curriculums of most MBA programmes in the United States, according to Hansen and Andreasen (2006), merging different knowledge perspectives and new insights from the field can be seen as a significant condition for innovation.

Fraser (2011) called for business leaders to embrace and fully realise the potential of design thinking in the enterprise in three areas, further noting that all three areas are

human-centric in nature and that this integration relies on the realisation that it is process-oriented and rooted in discovery. According to Fraser (2011: 72) 'the first area—'being'—focuses on design as a mindset. This mindset determines one's design readiness and can define a person's emotional agility. The six dimensions that are detailed in support of this area are openness, empathy, intrinsic motivation, mindfulness, adjustment, and optimism.' Fraser (2011) noted that taking a position on these dimensions is the first step required in order to achieve design success. This can often be difficult for business to embrace, as it may seem soft or non-rigorous.

The second area Fraser (2011) noted is 'doing', which focuses on a methodology that is rigorous and utilises tactical ability. Fraser (2011) clarified frameworks and tools as skills that can be learned. They can inform behaviour and shift one's perspective, which support the thinking process. Additionally, they define critical areas of action through 'doing', including holistic collaboration, problem finding and framing, iterative prototyping and experimentation, systems planning, narrative storytelling, and finally, co-creation. Fraser (2011: 73-74) stated that 'a masterful business designer considers the uniqueness of the challenge at hand and designs the process, frameworks and tools to most effectively and efficiently yield results….The purpose of the entire process is to draw the best thinking out of the group'.

The third and final area, according to Fraser (2011), focuses on 'thinking.' This area is concerned with the ability to develop a holistic capacity that utilises both 'being' and 'doing', fostering creative innovative thinking and agility. The six dimensions that Fraser (2011) claims support this area are emotional intelligence, systems thinking,

visualisation, abductive reasoning, synthesis, and perhaps most importantly, intuition. Fraser (2011: 74) further stated that 'through the practice of these methodologies, all forms of intelligence can be more fully developed and make the brain more "whole" on an individual level and more synergistic on a team or enterprise level'.

As such, Martin (2009) believed that in order for business's use of design thinking to succeed, knowledge must be created, developed, and delivered by an organisation that strikes a balance between analytics and creative intuition. Furthermore, as Martin (2009: 6) stated, 'Organizations dominated by analytical thinking are built to operate as they always have; they are structurally resistant to the idea of designing and redesigning themselves and their business dynamically over time'. Conversely, for organisations 'dominated by intuitive thinking…innovation may come fast and furiously, but growth and longevity represent tremendous challenges' (Martin 2009: 6).

Martin (2009) argued that a balanced model of value creation in business is not nice to have; rather, it is required in order to realise new and more robust innovation. This balance is built on the foundation of analytical thinking and intuitive thinking, which is rooted in design thinking. Martin (2009: 5) framed analytical thinking around two platforms of logic, 'deductive reasoning and inductive reasoning—to declare truths and certainties about the world'. In this way, intuitive thinking is described as 'the art of knowing without reasoning', stating that this is the world of 'originality and invention' (Martin 2009: 6).

Figure 3. The Predilection Gap

(Martin 2009: 54)

The key is to find balance, which Martin framed as design thinking (see Figure 3). This way of thinking enables information to be moved dynamically through what is referred to as the 'knowledge funnel' (Martin 2009: 7-8) (see Figure 4). With the knowledge funnel as the platform through which knowledge is developed, Martin contended that both modes of thinking, analytical and intuitive, have equal opportunities to contribute. And, as information moves through the funnel, new insights are gained and connections made. However, Martin (2009) noted that most organisations simply do not take full advantage of the knowledge funnel.

Figure 4. The Knowledge Funnel

(Martin 2009: 8)

The initial stage of the funnel is defined as the mystery. The mystery stage consists of the exploration of the designated problem and is rooted in questioning. Empathy plays a major role in this phase. Critical to the knowledge funnel's success is that non-analytical thinking is required at this stage in order to better frame the opportunities that will eventually be refined through the constraints of execution. The second phase of the funnel is referred to as the heuristic. It is in this phase that a rule of thumb is applied in

order to narrow the scope to a size that is manageable. Finally, the heuristic is converted into the algorithm stage. It is in this stage that the knowledge is refined from complex to simple.

One challenge to the success of this design process is that most organisations do not take full advantage of all aspects of the funnel platform (Martin 2009). According to Martin's research, organisations struggle to develop valid offerings because they simply remain in the last two phases of the funnel: the heuristic and algorithm. They rarely venture into the final stage, or mystery, because, Martin (2009) explained, it is not steeped in reliability and is difficult, if not impossible, to measure. As such, Martin (2009) contended, a design thinking organisation that is able to advance new knowledge from mystery to heuristic to algorithm gains a competitive edge over the competition. Having a competitive advantage, the organisation can utilise its design thinking ability to understand and address the next mystery, which enables an organisation to create further distance between itself and the competition (Martin 2009).

Finally, Martin (2009: 162) argued that business is missing a crucial aspect of reasoning, which is abductive. It is abductive logic that philosopher Charles Sanders Pierce (1878), also known as 'the father of pragmatism', framed as a way of discovering new knowledge and or ideas through not only observation, but more importantly, through wondering. Martin argued that designers start with this sense of wondering and that they actively search out new knowledge. He asserted that business-minded thinkers would be much better at innovating if they embraced and incorporated an abductive way of seeing. This would provide them with a better appreciation for the opportunities that

present themselves in the mystery stage of the funnel. However, most organisations are reliability-based, with a strong bias towards analytical thinking, rather than validity-based, which is rooted in qualitative questioning and empathic understanding, which makes it difficult to actually achieve meaningful innovation through the funnel (Martin 2009).

Another way of seeing and using design thinking is to understand the specific characteristics of exploration and exploitation (see Table 5). These characteristics map closely to Tovey's (2016) dual processing approach to design, with design often associated with exploring, while business is often associated with exploitation.

Table 5. Characteristics of Exploration and Exploitation

(Martin 2009: 20)

EXPLORE	EXPLOIT
Invent business	Administer business
Move to New Knowledge	Refine Existing Knowledge
Intuition	Analysis
Long-Term	Short-Term
Hypothesis about Future	Data from the Past
Originality	Mastery
Progress is Stop/Start	Progress is Measured
High Risk	Minimal Risk
Potential High Reward	Smaller Reward
Risk of not consolidating	Risk of Obsolescence

Similarly, Cross and Dorst (1998) noted that two spaces co-develop during the actual design process. These include both the problem space and the solution space. New insights, which are created in one space, informs a team's understanding of the other space.

Martin (2009) further contended that the difficulty of actually achieving meaningful innovation is that most organisations are reliability based with a strong bias towards analytical thinking, rather than validity based, which is rooted in qualitative questioning and empathic understanding. In effect, this means that organisations struggle to develop valid offerings because they simply remain in the last two phases of the funnel, the heuristic and algorithm. They rarely venture into the mystery.

Meyer and Schwager (2007:118) further supported this balance of thinking when they stated, 'Although few companies have zeroed in on customer experience, many have been trying to measure customer satisfaction and have plenty of data as a result. The problem is that measuring customer satisfaction does not tell anyone how to achieve it'. Topalian (2012) further argued that with growing global complexity, the co-creation of business and design innovation is vital to the success of the organisation. Innovation cannot be practised and achieved in isolation, and a hybrid leader who understands this and who is connecting business with design can enable the organisation to remain viable and grow through innovation outcomes that impact business directly (Topalian 2012). Critical to this condition, according to Topalian, is the fact the organisation leads through this integrated perspective in order for success to realised.

2.3.4 Design-Based Learning for Business

Continuous innovation is widely understood as a key to competitive advantage in business—in fact, innovation's tremendous influence on an organisation's growth and profitability is clearly confirmed through empirical evidence (Collins 2001). Currently, systematic and familiar approaches to innovation are readily used and measured in the quest for more meaningful products, services, organisations, and even processes that are in growing demand; however, Collins (2001) explained, being truly innovative is often much more complicated. Historically, innovation was built around existing or newly developed technologies that organisations identified as having potential value and thus profitability based on bringing it to market in a new and novel way (Collins 2001).

Innovation, and perhaps more importantly, the understanding and use of a particular innovation has often proven to be ever-changing: Design thinking as both an approach

and methodology for business leaders may have a role in this understanding (Collins 2001). In fact, Liedtka and Ogilvie (2011: 5) supported this when they said, ‘Design thinking can do for organic growth and innovation what TQM [Total Quality Management] did for quality—take something we always have cared about and put tools and processes into the hands of managers to make it happen’. Consumers use, accept, or reject innovations in ways that business not always foresee, and so teaching students of business to think is simply not enough. However, Brown (2008) held that thinking within the framework of design thinking may make an organisation more capable of constant innovation, meeting the needs of users while also increasing profitability because it is the identification, creation, development, and delivery of ideas that are critical for business.

Ideally, Brown (2008) noted, we need t-shaped innovators—ones who have depth in one domain and breadth across many others would be suited to take on the complex challenges required in continuous innovation needed today. Additionally, the desire to think and act ‘outside the box’ and to challenge convention is important; it can also lead to risky novelty solutions that lack depth and perhaps even are misaligned within the organisation. As Martin (2009) further argued, design thinking simply cannot be separated from business thinking. To that end, the challenge is to overcome the stereotypes of design in the business world. Avital and Boland Jr. (2008: 10) stated that ‘managers should adopt a design attitude’; however, Lockwood (2002 cited in Teixeira 2009: 560) argued that the difficulty is that current strategies in education create a knowledge gap and, consequently, a communication gap between business and design:

> [D]esign was perceived as irrelevant to decision making in business….designers were not being taught business, and the consequential awareness and educational gap made it difficult for design and business to collaborate.

Teixeira (2009) contended that 21st-century organisations need professionals who bring multi-faceted competencies that are transferable to new complex situations. Teixeira (2009: 557) also argued for the competitive advantages of design competencies:

> If design competencies—such as qualitative thinking, speculation, ideation, prototyping, specification—are in high demand in economies driven by the creation of innovative ideas, it's because the transferability and efficiency of these competencies regarding innovation is a large competitive advantage in knowledge economies.

This argument is further supported by the Design Management Institute's 2016 report, noting that design-led businesses outpaced the market S&P by 211% (cited in Rae 2016; 4). Bauer and Eagen (2008) noted that design is focused on how things should be and that design is not confined to one domain, but rather, design as a way of thinking is transferable to many domains, including and perhaps most importantly to business. Girard (1990) further argued that the path forward is in the ways of designing. Lockwood (2009) further supported this when he averred that the goal of design is to drive change—to be a tool of innovation—and many organisations today see the competitive advantage of embracing change and innovation. Design influences the way a user perceives a product, which then influences customer satisfaction, which, in turn, will influence future product perception.

Design-based learning is an approach to understanding and addressing problems from which new market value can be realised through the demonstration and delivery of human-centred innovation (Teixeira 2009). Furthermore, design thinking is multi-epistemic, using various ways of knowing (thinking, feeling, sensing, and intuiting), which support the ability to solve problems creatively. Additionally, a design thinking approach has the ability to address complex problems that often go beyond cognitive and analytical problem-solving skills, which are typically associated with business-based learning (Teixeira 2009). These cognitive and analytical skills are simply not enough in order to address complexity and generate innovative solutions to problems; however, design thinking offers a new way to approach a problem, which can lead to novel solutions (Teixeira 2009). Scholars have noted the need for more innovative ways to approach problems in the business field in order to address limitations. Sutton (2001) further supported this when looking at the limits of rational business knowledge and its application to innovation, noting that every organisation seeks to be innovative, but very few have developed methods or a process to address it, arguing that the historical rules for management do not necessarily apply anymore when it comes to innovation. In addition, Meisiek (2016: 163) stated, 'the very notion of what organizations are and do is changing'.

2.3.5 Design-Based Learning in Business Education

Because of this shift, business students may often not be prepared to be future leaders in complex organisations with interconnected business challenges, according to Teixeira (2009). In order to realise their full potential in the business world, business students might seek to integrate into more interdisciplinary curricula, using design-based approaches to learning that may enable them to understand and interpret different ways

of thinking from a broader set of stakeholders (Teixeira 2009). Zidulka (2016: 204) argued that in her business classes, ‘emphasizing the importance of beginning with and attaining deep understanding of users has seemed effective in opening students to more nuanced possibilities, as opposed to defaulting to stock business solutions’. This gathering of new knowledge is further supported by Hollern (2016: 181) when he said, ‘a primary and enduring objective of higher education itself is the generation of new knowledge or advancement of knowledge’.Teixeira (2009: 563) stated, ‘If programs in design and business administration could be integrated in a new specialization, a new breed of entrepreneurs, leaders, activists, and strategic managers could emerge’.

In fact, Hollern (2016) built the case, believing that we must consider new models of design that expand the role and impact of design. Education can be the catalyst for a new horizon of design, and this higher call can be realised through new models of education that create opportunities and facilitate more collaborative learning. However, Hollern (2016) argued that design thinking in business education cannot simply be a product of discourse: It must be nurtured and sustained in a cross-pollinated environment that requires space, opportunity, time, and genuine synthesis, noting that simply thinking suggests a providence of one, while design thinking suggests the possibility of many participants. As such, design thinking must be a collaborative and inclusive process that produces outcomes, which are informed by various points of view (Hollern 2016).

Design thinking in business education cannot simply be a product of discourse; design thinking must be learned through action and experiences. Kolo and Merdes (2016)

contended that business needs to nurture and build favourable conditions that enable not only creation but also processes that allow for the iteration and development of ideas into marketplace opportunities that can find acceptance by users that have more and more choice at hand. In design, the favourable condition is often found and nurtured in the studio environment, and as such, in order for students of business to actually activate design-based learning, they would need the supportive environment of a studio in order to support their engagement with design thinking methodologies (Kolo and Merdes 2016). The studio environment, a staple of design education, might allow for a more integrated approach to design and business. The challenges and thus the opportunities to integrate design thinking into business classrooms become more and more apparent when you look at the totality of needs that arise from complicated systematic needs.

Historically, business management needed to gain legitimacy, and to do so, it moved from a craft towards a science: Business schools developed a reliance on rigorous data gathering and analysis, both of which became the foundation of decision-making for management (Datar, Garvin, and Cullen 2010). In doing so, the world of business moved closer to economics. However, one could argue that such a rigorous and rigid scientific perspective provides a limited perspective towards decision-making and the realities of complexity and societal unknowns.

According to Bennis and O'Toole (2005), marketing, finance, operations, strategy, and accounting are core elements of the scientific and or proof-based foundation of business education; they are fundamentally focused on process-driven operationalisation of

innovation, and they are heavily focused on managing and securing profit for the innovation realisation. It is these core elements that are familiar and comfortable to management. These elements anchor the context of innovation within the organization (Bennis and O'Toole 2005). Design thinking, on the other hand, is fundamentally about discovering, framing, and developing innovation in content. As such, business and design operate in two different worlds (Teixeira 2009).

The implied promise of design thinking is that with such a toolkit and mindset, business management may be better equipped to solve complex problems (Fraser 2006). In the design world, studios are places of experimentation and iteration, and as such, the combination of design and management in a studio environment may indeed lead to unexpected breakthroughs of new knowledge that are better informed and can, in turn, create value for business (Tovey 2016). It is in this place that design and management can come together on the basis of true human understanding, rather than simply the development of the next object to put into the marketplace (Fraser 2006). Meisiek (2016: 164) explained the benefits of studio space and pedagogies:

> Education at business schools can benefit from having dedicated studio space. Along with studio pedagogies, it promotes experimental, problem-based learning around business issues and techniques. It is a place where teachers and students can work with processes like tangible business modeling, dramaturgic approaches to organizational behavior, visual and haptic design of organizations, strategies, and creative explorations of innovation and changes.

If managers can become design thinkers, they have a greater potential to understand, frame, solve, and execute on the opportunities that may or may not be obvious and/or wicked (Martin 2009).

Proponents of design thinking celebrate the power of its ability to simplify and provide clarity, which allows design thinking novices the ability to understand and execute on it quickly (Fraser 2006). The collaborative and team-based approach within a studio setting allows design thinking participants to realise gains in understanding quickly (Tovey 2016). Bringing scientific business content together with design thinking processes in a meaningful way is the challenge for a studio setting with a business school (Martin 2009). In doing so, research shows that it is important to not create a studio of design 'exclusivity'. As Tovey (2016) explained, the studio needs to be inclusive, as design needs to move towards business: A design studio within the business education context brings about a 'living' conversation that promotes experimentation and problem-based learning.

Furthermore, Tovey (2016) noted that the design studio environment, in which students actively engage in design activities, is both a social and cultural entity for design where the integration of thinking and action occurs. Tovey (2016: 63) said this about the students' experience in the studio: 'It is the arena in which there is the opportunity to achieve the integration of ideas which is at the core of design synthesis. It is also the place where they can mimic professional design activity'. Schön (1985) identified the studio as being the site of cultural practices, which included ways of teaching and modes of being and acting. Furthermore, Rusk (2016: 191), stated that 'design studios

are communities of practice, and traditional learning activities in design take place through studio practice, a social context where strategic design (giving form to decision making) is a key principle', while, according to Cross (1982 cited in Rusk, 2016: 192), a design studio encourages 'collaboration and shared experience of ideas as well as…reflection, peer review, and evaluation'.

Smith Taylor (2009) noted the design studio facilitates particular ways of teaching that in turn lead to a student-centred approach that is healthy for design to thrive, as it removes the teacher from the central focus, not like business-school lecture halls; it also requires the students to be mobile and as a result, more collaborative. The design studio benefits greatly from the organic learning and support at a peer level of engagement. Active participation, articulation of ideas, and discussion feedback loops are central to the environment. According to Zidulka (2016), the creative energy and spark of a design studio setting is not entirely the result of the adoption of a particular way of thinking or a specific process, but rather from an environmental culture of openness and experimentation.

Furthermore, Lawson (2005) noted that the dialogue within the design studio environment, built upon a student-centred approach, is critical to robust engagement of ideas, the practice of debate, and collaborative thinking. Students learn and practise the language of design either verbally, visibly, or critically. As such, Lawson (2005: 291-299) identified six critical components that empower this harmonisation and contends that these components need to be addressed in any situation where design is taught and supported:

- Formulating—Understanding problems through identification, reframing, and structuring complex problems;
- Representing—Visualizing ideas;
- Moving—The generation of not one but rather many ideas;
- Bringing problems and solutions together—Synthesizing along parallel ideas;
- Evaluating—Looking both objectively and subjectively at options awhile also suspending judgment in order for further creative thinking and idea generation to occur; and
- Reflecting—The process of stepping away and taking the time for thoughtful review.

As such, design-based learning can only be effectively developed when both design understanding and design capabilities utilise all six components (Lawson 2005). Tovey (2016: 63) further supported the importance of these six components as critical to the teaching of design, saying, 'they are so closely integrated with each other but they cannot be considered as a curriculum of separate topics. What is required is for them to be addressed in integrated design project work in which design skills can be learned, practiced and improved'.

2.4 Business School

2.4.1 Business School Context

Harvard University launched the first Master of Business Administration (MBA) degree in the United States in1921, and according to Rusk (2016), the MBA is the recognised gold standard and often required degree by business management. The demand for business leadership in 1959 was highlighted in a commissioned study by the Ford and

Carnegie foundations, entitled *Higher Education for Business*. The report, published in 1959, recognised the under-performing state of business school education and theories. The authors, Gordon and Howell (1959), stated that the majority of programmes granting a master degree in business were generally not rigorous. The foundations' concerns, further informed by the study, culminated in a grant, which supported top business institutions and asked that they present and practise in a manner that is reflected in law schools.

This mandate led to most business schools developing and offering a more stringent curriculum, replicating the academic excellence of science-based programmes, which changed the focus and overall objective in business education. That change drove increased scientific research and thus scientific rigour. Van Aken (2001: 1) argued that the 'scientization' of business schools was driven by the social science model, where perceived rigour outweighed relevance. According to Clarke and Primo (2012), it is this science-based approach that has lead business schools to have what is called 'physics envy'. In the world of science, the term 'physics envy' is used to criticise the liberal arts and softer sciences by looking to mathematical expressions of concepts in order to shift them to the sciences.

As a result, the study of business is conducted by those who believe it to be science based. Based on this position, professors who advance in academia, controlling both faculty and curriculum, do so by reputation in publication. As a result, the curriculum is often scientifically oriented. Bennis and O'Toole (2005) further noted that the scientific approach is utilised by most business-school professors, in which they utilise existing

data to form ideas at the beginning, then apply regression analysis tools and simulations to shape and scale the idea. They do not start with understanding of actual people.

According to Triggs (2011), business schools have historically been seen as places guided by strict rules of engagement that are rigorously focused and linear in process. As such, the messy and often ambiguous problems that take place in the business world are often not addressed in business teaching. Furthermore, according to Bennis and O'Toole (2005: 102), 'the problem is not that business schools have embraced scientific rigor, but that they have forsaken other forms of knowledge' and that employers are recognising that business school graduates lack creative problem-solving skills and deep human understanding. Khurana and Spender (2013) noted that today's business school education is excessive with respect to analytical, quantitative techniques.

Harvard University business professors Datar, Garvin, and Cullen (2010) contended that while MBAs are well trained analytically, they are deficient in critical innovative thinking skills. They need generative, innovative, and lateral thinking skills in order to discover, create, and launch truly game-changing innovation in the marketplace:

> Faced with a clearly defined, targeted problem, MBAs are in their element, ready and able to apply spreadsheets, decision trees, financial models, and high-powered statistical methods. But faced with unstructured problems and ambiguous data, rapidly changing environments, and information overload—challenges that are common today, especially in emerging industries, nascent markets, newly regulated or deregulated sectors of the economy—MBAs…are less likely to be effective. (Datar, Garvin, and Cullen 2010: 95)

University of Pennsylvania's Wharton School of Business professor Schoemaker (2008) further supported this point, arguing that the current MBA tools and techniques are inadequate. McGill University professor Mintzberg (2009) criticised the MBA curriculum, suggesting it was less than relevant. He explains that it is impossible to fix a traditional MBA programme because they are built upon the inexperience of the young students enrolled in them. Mintzberg (2009) further argues that no one should be enrolled in an MBA programme until they have proper experience in management positions—that way, the programme is built around those who have learned from their own experiences and are able to think beyond textbook analytical thinking. They are able to innovate from what they know, not from what they are told.

Furthermore, Datar, Garvin, and Cullen (2010) argued that MBAs must master new skills in order to innovate, including the ability to find and frame problems, synthesise complex information, utilise creativity, and test and iterate ideas. Bennis and O'Toole (2005) further contended that business schools are misguided and that they are failing to impart useful skills. They also noted that actual reforms in business education are not apparent, arguing that the MBA curriculum for all intents and purposes is the effect, and not the cause, further noting that the adoption of the scientific method by business schools has led to an overreliance on abstract financial and economic analysis and statistical regressions.

According to Datar, Garvin, and Cullen (2010), students of business are predominately taught via lectures and case studies; they are limited in the ability to train in areas that are ambiguous. Lectures provide a passive form of learning and provide little value with

respect to understanding how to solve complex unstructured problems. The case study method is more active but generally has structured boundaries to problems that have a narrow focus and are often defined upfront. As such, they argue that a rebalancing of MBA education towards skills focused on innovative 'doing' is required and that active project-based learning opportunities are critical to galvanizing the concepts and building confidence in a student's ability to be innovative. Datar, Garvin, and Cullen (2010: 8) argued that merely learning about innovative thinking and creative approaches to solutions, such as brainstorming, experimentation, and more, in theory does not fully prepare MBA students to apply that thinking and those approaches in the workplace. Students need to continually experiment with and be immersed in innovative thinking and creative approaches before they reach the workplace—they need to be free to experiment with unconventional thinking, empathic considerations, and other creative approaches in the learning environment. The authors (2010: 8-9) identified seven unmet needs of MBA programmes:

1. Gaining a global perspective: Identifying, analyzing, and practicing how best to manage when faced with economic, institutional, and cultural differences across countries.
2. Developing leadership skills: Understanding the responsibilities of leadership; developing alternative approaches to inspiring, influencing and guiding others; giving critical feedback; and recognizing the impact of one's actions and behaviors on others.
3. Honing integration skills: Thinking about issues from diverse perspectives, shifting angles to frame problems holistically; learning to make decisions based

on multiple, often conflicting, functional perspectives; and building judgment and intuition into messy, unstructured situations.

4. Recognizing organizational realities and implementing effectively: Influencing others and getting things done in the contexts of hidden agendas, unwritten rules, political coalitions, and competing points of view.
5. Acting creatively and innovatively: Finding and framing problems; collecting, synthesizing, and distilling large volumes of ambiguous data; engaging in generative and lateral thinking; and constantly experimenting and learning.
6. Understanding the role, responsibilities, and purpose of business: Balancing financial and non-financial objectives while simultaneously juggling the demands of diverse constituencies such as shareholders, employees, customers, regulators and society.
7. Understanding the limits of models and markets: Asking tough questions about risk by questioning underlying assumptions and emerging patterns; seeking to understand what might go wrong; learning about the sources of errors that lead to floor decision-making and the organizational safeguards that reduce the recurrence; and understanding the tension between regulatory activities aimed at preventing social harm in market-based incentives designed to encourage innovation and efficiency.

2.4.2 United States Business School Backgrounds and Curriculum

Business School Rankings—Top Ten in the United States

This ranking comes from the five leading business publications in the United States (see Table 6) and is centred on business schools in the United States. Potential candidates of

MBA programmes evaluate schools based on these publications when making decisions about which school is right for them and where that school ranks in the business school landscape within the United States. The researcher's school, the Kellogg School of Management at Northwestern University, was ranked 5th best business school nationally in 2016 by leading business publications, as noted below in Table 6 (it is currently ranked as the 4th best business school nationally by *U.S. News and World Report* [2018]—tied with MIT and Stanford).

Table 6. Business School Rankings—2016: Top Ten in the United States (author table compiled from U.S. leading business publications' 2016 ranking)

Business School Rankings – 2016

Top Ten in the United States

AVERAGE RANKING	INSTITUTION	FINANCIAL TIMES	BUSINESS WEEK	ECONOMIST	US NEWS	FORBES
1	Harvard Univ. – HBS	1	1	4	2	2
2	Univ. of Chicago – Booth	6	2	1	4	6
3	Stanford Univ. – GSB	3	7	11	1	1
4	Univ. of Pennsylvania – Warton	2	5	8	3	7
5	Northwestern Univ. – Kellogg	8	3	6	6	3
6	Columbia Univ. – Columbia Business School	4	6	10	8	4
7	MIT – Sloan School of Business	5	4	12	5	9
8	Univ. of California at Berkeley – Hass	7	9	5	7	8
9	Dartmouth College – Tuck	12	14	3	9	5
10	Yale Univ. – Yale School of Management	9	11	13	13	11

Ranking methodology:

- Peer assessment
- Recruiter assessment
- Mean starting salary and bonus
- Employment rates for full-time MBA programme graduates
- Student selectivity—GMAT, GRE, undergrad GPA, acceptance rate

Business School Teaching—Pedagogic Technique

The following granular breakdown of the teaching methodology (see Table 7) comes from universities in the United States that self-report to the business publication *Bloomberg BusinessWeek*.

Table 7. Business School Teaching—2016: Pedagogic Technique

(author table compiled from U.S. business schools' self-reported data to *Bloomberg Business Week*)

Business School Teaching – 2016 PART 1

Pedagogic Technique

AVERAGE RANKING	INSTITUTION	TRADITIONAL CLASSROOM TEACHING	EXPERIENTIAL LEARNING
1	Harvard Univ. – HBS	95%	5%
2	Univ. of Chicago – Booth	95%	5%
3	Stanford Univ. – GSB	85%	15%
4	Univ. of Pennsylvania – Warton	85%	15%
5	Northwestern Univ. – Kellogg	85%	15%
6	Columbia Univ. – Columbia Business School	93%	7%
7	MIT – Sloan School of Business	80%	20%
8	Univ. of California at Berkeley – Hass	83%	17%
9	Dartmouth College – Tuck	88%	12%
10	Yale Univ. – Yale School of Management	90%	10%

Overall, case study, lecture, and project methods have been universally part of business school pedagogies in the United States. When these methods are added together, they significantly outweigh experiential learning as a teaching method in business schools (see Table 8).

Table 8. United States Business School Teaching—2016: Pedagogic Technique (author table)

Business School Teaching – 2016 PART 2

Pedagogic Technique – Traditional Classroom Teaching Breakdown

AVERAGE RANKING	INSTITUTION	CASE STUDY	LECTURE	TEAM PROJECT	EXPERIENTIAL LEARNING
1	Harvard Univ. – HBS	80%	5%	10%	5%
2	Univ. of Chicago – Booth	60%	30%	5%	5%
3	Stanford Univ. – GSB	40%	20%	25%	15%
4	Univ. of Pennsylvania – Warton	40%	20%	25%	15%
5	Northwestern Univ. – Kellogg	30%	30%	25%	15%
6	Columbia Univ. – Columbia Business School	40%	38%	15%	7%
7	MIT – Sloan School of Business	33%	25%	22%	20%
8	Univ. of California at Berkeley – Hass	50%	20%	13%	17%
9	Dartmouth College – Tuck	45%	23%	20%	12%
10	Yale Univ. – Yale School of Management	40%	34%	16%	10%

The Case Study Method

The case study method, as described by Johansson (n.d.) and further informed by the researcher's experience, is a learning style used by business schools in the United States and focus on the student as the decision-maker. This method is in place of traditional academic member-led lectures and encourages class interaction and discussion in order

to develop solutions to a particular case study. Academic members in business schools, who often work with industry to ensure that they accurately reflect business problems, write the cases used by the students.

In advance of the specific seminar, students are presented with a case on which they are required to work individually and propose a solution. Within the seminar, the students are then required to explain their rationale to their classmates in a debating environment that is facilitated by an academic member. The cases are developed in such a way as to present typical yet specific problems that are likely to occur in the real world. The objective is to develop and test both the students' analytical and communication abilities in the service of solving problems.

The Harvard School of Business at Harvard University pioneered the case-study method in business school, and students read over 500 cases during their two year MBA programme at Harvard. The case-study method has benefits and drawbacks.

Pros:

- Simulates a real business environment
- Data oriented (historically rooted in measurable facts)
- Solves a problem
- Interactive class setting—students discuss, debate, persuade
- Structured facilitation by academic member

Cons:

- Simulates a real business environment
- Not actively human centred

- Singular-solution focused and developed by individual student
- Not interactive in terms of prototyping and testing ideas with stakeholders
- Does not allow for feedback loops and idea builds with stakeholders

(Johansson n.d.)

The Lecture Method

The lecture method, as described by Paris (2014) and further informed by the researcher's experience, is a learning style used by United States business schools and has a focus on the academic member's wisdom and presentation skills. This is the traditional learning style in which the academic member gives a structured talk, often supported by a visual presentation. Lectures, which are utilized in teaching at a large scale, efficiently manage and control the content, context, and cadence.

Pros:

- Structured, familiar, and efficient

Cons:

- Academic member is front-and-centre
- Lack of active student engagement and participation
- Often delivered to large student audiences (Harvard required core course average class size is 90 students)

(Paris 2014)

The Team Project Method

The team project method, as described by DeFillippi (2001) and further informed by the researcher's experience, is based on small student teams working on a structured project

that is directed by the academic member. These projects are more often facilitated in the classroom.

Pros:

- Stimulates student interest
- Action oriented
- Team oriented

Cons:

- Could be simulated

(DeFillippi 2001)

The Experiential Learning Method

The experiential learning method, as described by Kolb and Kolb (2005) and further informed by the researcher's experience, is based on students applying learning and understanding to actual real-world problems, gaining new knowledge through the experiences, and directed by the academic member who facilitates and contributes to hands-on learning. This method is most often supported by a real-world partner who provides the initial challenge conditions and who may be active in the engagement and learning of the student.

Pros:

- Opportunities for students to learn through struggles and finding success through authentic action-oriented practice
- Opportunities for students to discover, analyse critically, synthesise and reflect
- Opportunities for students to have ownership and make accountable decisions.

- Opportunities for students to actively engage and be stimulated at many levels on real-world project challenges

Cons:

- Learning motivation can be challenge subject dependent
- Learning can be stakeholder dependent
- Challenge can be difficult to scope
- Challenge can be overly time-consuming

(Kolb and Kolb 2005)

2.4.3 United States Business School Required Core Curriculum

Overview

Courses and/or content from business school to business school appear comparable for two-year full-time programmes. The top ten business schools in the United States are no different. They all rely on a fixed required core that varies in size from the smallest (five courses at MIT Sloan School of Management, Massachusetts Institute of Technology) to the largest core of 19 courses at Stanford Graduate School of Business (GSB), Stanford University.

All remaining coursework is made up of electives, which are pre-approved by the business school and are more often than not aligned with the student's business interest, i.e., marketing, operations, finance, strategy, etc. Students can earn various majors within their business school by taking a defined number of qualifying courses in that particular business domain. Only three schools in the top ten require a 'design-centric' course as part of their core business curriculum. They are outlined below.

Design-Centric Courses as Part of MBA Core

1. The Kellogg School of Management, Northwestern University:

The Kellogg School of Management (n.d.) is on the academic quarter system, requiring a 10-week, full-credit course entitled Research-Design-Build (RDB). A total of 60 students, as part of the specialised MBA MMM programme, are required to take this course as part of their specific core. A total of 418 first-year students that are in the regular full-time MBA programme do not take Research-Design-Build (RDB). The Kellogg School of Management (n.d.) undergraduate majors profile for 2016 is as follows:

- Economics/Business 45%
- Science, Technology, Engineering, Mathematics 29%
- Humanities 28%

(Kellogg School of Management at Northwestern University n.d.)

2. Haas School of Business, University of California Berkeley:

The Haas School of Business (Berkeley Haas n.d.) is on the academic semester system, requiring a seven-week, one-credit (half semester long) course entitled 'Problem Finding, Problem Solving'. All MBA students are required to take this course as part of the core MBA curriculum. A total of 250 students take this per year as part of the first year MBA curriculum at the Haas School of Business. The Haas School of Business undergraduate majors profile for 2016 is as follows:

- Humanities and Social Science 33%
- Business 24%
- Economics 18%

- Engineering/Informational Systems and Computer Science 18%
- Mathematics and Physical Sciences 9%

(Berkeley Haas n.d.)

3. The Yale School of Management, Yale University

The Yale School of Management (n.d.) is on the academic semester system, requiring a seven-week, one-credit (half semester long) course entitled 'Innovator'. All MBA students are required to take this course as part of the core MBA curriculum. A total of 334 students take this per year as part of the first-year MBA curriculum at the Yale School of Management. The Yale School of Management (n.d.) undergraduate majors profile for 2016 is as follows:

- Humanities and Social Science 33%
- Business 22%
- Economics 17%
- Engineering/Informational Systems and Computer Science 17%
- Mathematics and Physical Sciences 11%

(Yale School of Management n.d.)

Breakdown of Courses and Specific Class Details

Data were gathered through direct interviews with the academic members that teach these courses as well as an audit of the published syllabi for each course (see Table 9 below).

Table 9. Breakdown of Courses and Specific Class Details

(author table)

Breakdown of Courses and Specific Class Details:

SCHOOL / COURSE	TEAM TEACHING	CLASS SIZE	LECTURES USED	CASES STUDIES	READINGS	EXERCISES	MINI PROJECT	EXPERIENTIAL LEARNING
Kellogg — RDB	✓	30	✓			✓		✓
Haas — Problem Finding, Problem Solving		60	✓	✓	✓	✓	✓	
Yale — Innovator		65	✓	✓	✓	✓	✓	

Required Core Curriculum (in Ranked Order)

1. Harvard Business School—Harvard University

Average core class size: 91 students

Average elective class size: 33 students

Required core curriculum:

- Finance 1
- Financial Reporting and Control
- Leadership and Organizational Behavior
- Marketing
- Technology and Operations Management
- Business, Government, and the International Economy
- Strategy
- The Entrepreneurial Manager

- Finance 2
- Leadership and Corporate Accountability

(Harvard Business School n.d.)

2. Booth School of Business—University of Chicago

Average core class size: 58 students

Average elective class size: 45 students

Required core curriculum:

- Financial Accounting
- Microeconomics
- Statistics
- Corporate Finance
- Financial Strategy
- Marketing Management
- Advanced Marketing: Pricing
- Operations Management
- Managerial Accounting
- Managerial Decision Making
- Negotiations
- Essentials of Effective Leadership
- Organizations and Incentives
- Leadership Capital
- Competitive Strategy

(University of Chicago Booth School of Business n.d.)

3. Stanford Graduate School of Business—Stanford University

Average core class size: 48 students

Average elective class size: 33 students

Required core curriculum:

- Ethics in Management
- Financial Accounting
- Leadership Lab
- Managerial Skills
- Managing Groups and Teams
- Optimization and Simulation Modeling
- Organizational Behavior
- Strategic Leadership
- Corporate Finance
- Data Analysis and Decision Making
- Finance
- Human Resource Management
- Information Management
- Macroeconomics
- Managerial Accounting
- Marketing
- Microeconomics
- Operations
- Strategy Beyond Markets

(Stanford Graduate School of Business n.d.)

4. Wharton School of Business—University of Pennsylvania

Average core class size: 48 students

Average elective class size: 30 students

Required core curriculum:

- Foundations of Teamwork and Leadership
- Marketing Management
- Operations Management
- Microeconomic Foundation
- Advanced Topics in Managerial Economics
- Regression Analysis for Managers
- Speaking
- Writing

(Wharton School n.d.)

5. Kellogg School of Management—Northwestern University

Average core class size: 64 students

Average elective class size: 39 students

Required core curriculum:

- Leadership in Organizations
- Business Strategy
- Marketing Management
- Business Analytics I
- Business Analytics II
- Microeconomic Analysis

- Finance I
- Operations Management
- Accounting for Decision Making
- Research-Design-Build (RDB) (Design Thinking—see course overview below) Research-Design-Build (RDB) Course Overview: Research-Design-Build (RDB) is a dynamic, hands-on course structured as a 'studio' practicum course, and as such, focuses on design research and design thinking, core concepts and methodology with a strong focus on innovation built on contextual user needs. The course utilizes a project-based approach to learning through an empathic design thinker's lens. Students will understand unmet and unarticulated user needs, synthesize information, frame problems, generate ideas, evaluate those ideas, build and test concepts and build a business model that reflects user desirability, technological feasibility, and business viability.

(Kellogg School of Management at Northwestern University n.d.)

6. Columbia Business School—Columbia University

Average core class size: 62 students

Average elective class size: 43 students

Required core curriculum:

- Lead: People, Teams, Organizations
- Managerial Statistics
- Strategy Formulation
- Marketing
- Financial Accounting

- Corporate Finance
- Managerial Economics
- Business Analytics
- Global Economic Environment
- Operations Management

(Columbia Business School n.d.)

7. MIT Sloan School of Management—Massachusetts Institute of Technology

Average core class size: 65 students

Average elective class size: 47 students

Required core curriculum:

- Economic Analysis for Business Decisions
- Data, Models, and Decisions
- Communication for Leaders
- Organizational Processes
- Financial Accounting

(MIT Sloan School of Management n.d.)

8. Haas School of Business—University of California Berkeley

Average core class size: 59 students

Average elective class size: 44 students

Required core curriculum:

- Data and Decisions
- Economics for Business Decision Making

- Ethics and Responsible Business Leadership
- Financial Accounting
- Introduction to Finance
- Leadership Communication
- Leading People
- Macroeconomics in the Global Economy
- Marketing Management
- Operations
- Strategic Leadership
- Problem Finding, Problem Solving (Design Thinking—see course overview below)

  ‘Problem Finding, Problem Solving’ Course Overview:

  This course focuses on delivering those basic innovation skills—drawn from the fields of critical thinking, design thinking and systems thinking. Specifically, discussing ways of collecting information to characterize a problem, framing and re-framing that problem, coming up with a range of solutions and then gathering feedback to assess those solutions. Problem Finding, Problem Solving is fundamentally about how people can ask better questions and find better answers in our businesses and in our jobs. The course introduces students to a number of processes, tools and mental models in a fast way and not in great depth.

(Berkeley Haas n.d.)

9. Tuck School of Business—Dartmouth College

Average core class size: 65 students

Average elective class size: 35 students

Required core curriculum:

- Analysis for General Managers
- Capital Markets
- Competitive and Corporate Strategy
- Corporate Finance
- Decision Science
- Financial Measurement, Analysis, and Reporting
- Global Economics for Managers
- Leading Individuals and Teams
- Leading Organizations
- Management Communication
- Managerial Economics
- Marketing
- Operations Management
- Personal Leadership
- Statistics for Managers

(Tuck School of Business, n.d.)

10. Yale School of Management—Yale University

Average core class size: 58 students

Average elective class size: 25 students

Required core curriculum:

- Managing Groups and Teams
- Basics of Accounting
- Probability Modeling and Statistics
- Global Virtual Teams
- Modeling Managerial Decisions
- Introduction to Negotiation
- Basics of Economics
- Competitor
- Investor
- Employee
- The Global Macro Economy
- State and Society
- Customer
- Sourcing and Managing Funds
- Operations Engine
- The Executive
- Innovator (Design Thinking—see overview below)

  ‘Innovator’ Course Overview:

  This course uses the innovator’s perspective to study issues of idea generation, idea of evaluation, idea of refinement and development, the establishment of creative projects, in fostering and sustaining innovation in organizations. The course further emphasizes a view of innovation as a process that can and should be systemized, but that is fraught with complexities and barriers to overcome.

> The course is multidisciplinary and multi-approach, using a mixture of exercises, cases, lectures, and discussions. Students will generate ideas, evaluate and improve them, and analyze different aspects of innovation in a range of organizations and sectors. Ultimately the course seeks to provide students with a deeper understanding of the dynamics of and barriers to innovation.

(Yale School of Management n.d.)

2.5 Conclusions

The following statements are drawn from the above with a view to clarifying the main findings that may become part of the specification for a new curriculum.

2.5.1 Designerly Ways: What Designers Do

Design

- Design has moved past the notion of simply the creation of beautiful objects.
- Design has been described in many different ways, including a solution-led activity that seeks to understand and solve problems through reflective practice.
- Design is inherently creative.
- Design is oriented to what is possible.
- Design is a human activity.
- Design is iterative and nonlinear.

The Role of Creativity in Design

- Design and creativity are directly connected, as creativity fuels imagination, which is critical when developing something new.

- Creative individuals often seek new ways of thinking.
- Creativity is a choice that people make based on attitudes towards life.
- Creativity is not always expected in business.
- Creative thinkers are underrepresented in business.
- Creativity can be taught.

Design in Innovation

- Design can be seen as a catalyst for innovation.
- Design and innovation are often seen as connect processes that look to develop and drive value.
- Design gives form to decision-making in the innovation process.
- Concept development is an important activity.
- Innovation is often associated with change, and design is valuable as a way to share developing ideas and shape new perceptions that drive innovation.

Design Thinking

- Design thinking has been described in many different ways, including a cognitive process related to processing and decision-making, an act of imagination and creativity, and a user-centred problem-solving approach.
- Design thinking is human-centric and is based on a deep understanding of people that is informed through empathy.
- Design thinking is not restricted to the specific discipline of design, and can be taught to individuals who have shared values and a creative passion.

- Design thinking requires a balanced approach of problem-focus (analytical) and solution-focused (creative).
- Design thinking enables people to see and act differently but can also be seen as a novelty in the minds of efficiency-led individuals and organisations.
- Design thinking is action-oriented and collaborative.

The Role of Empathy in Design Thinking

- Empathy helps to frame new knowledge from people, which is fundamental to solving problems in the service of innovation.
- Empathy is a quality of the design thinking process.
- The phases of empathy in the design thinking process include discovery, immersion, connection, and detachment—all of which are deeply personal.
- Empathy is fully realised in the design thinking process through the melding of cognitive reasoning and affective resonance.
- Empathy may improve the likelihood of making decisions that will have long-term positive outcomes for people.
- An empathic framework can inform creative possibilities and richer decision spaces.

Design Thinking and Strategy

- Design thinking has an opportunity to contribute to business strategy as markets struggle with growing complexity and organisations look for new approaches to recognise, anticipate, and understand challenges and opportunities.

- Leadership and management theory are based on military strategy, and as such, business strategy is often rooted in rational and analytical science, which is different from a design thinking approach.
- Traditional hierarchical ways of business strategy need to be more flexible in order to realise the complicated need for competitive advantage.
- In a world that is unpredictable and complex, we need more collaborative approaches that inform strategies that both address current and future needs.
- Business leaders understand the value of design authentically when they practise it themselves.
- Design thinking can help facilitate 'big picture' understanding of multifaceted problems that are central to strategic thinking and planning.
- Strategy is often developed and measured through the lens of optimisation and exploitation, while design thinking provides a third lens, which is validity.
- Good strategy involves making choices, and the more well-rounded the inputs are to the decision-making process, the more meaningful the decisions could be.
- Design as a stand-alone is not sufficient for a business strategy; however, design can inform the strategy of evolving ecosystems.

2.5.2 Design and Business: Context and Learning

The Business Gap for Design

- The business world often sees design as irrational.
- Business often emphasises analysing existing information, while design thinking often emphasises the discovery and understanding of new knowledge.

- Business processes are based on an analytics-first approach, while design processes are more subjective and qualitative in nature.
- Business is not comfortable with ambiguity, while design thinking thrives on ambiguity.
- Most business approaches are linear, while a design thinking approach is iterative and nonlinear.
- Business relies on objectivity and rationality, while design thinking relies on the understanding of the human experience.
- Business is often tactically focused and less innovation-oriented.
- Business rewards systems are rooted in probability, while design is possibility-based.
- Business values stability and control, while design is comfortable with uncertainty.
- Business-minded individuals and design-minded individuals are often uncomfortable with each other.

Design and Business School

- Business students often default to modes of problem-solving that they are comfortable with and that are readily used by peers in the business school.
- Business schools emphasise an analytical approach with a focus on planning and optimisation.
- Analytical methods are best suited to clearly understood problems, where data can be a predictor of the future.

- Design thinking is well suited for problems that are ill-defined and not understood.
- Cross-disciplinary approaches that enable seeing and acting more holistically can enable more and better innovation.
- Business school education often focuses in on ‘what is’, while design is often focused on ‘what could be’.
- Design skills such as empathy, problem framing and reframing, human-centred storytelling, and visualisation are allusive to business students.
- The teaching of design tactics, such as ethnographic research, framing, ideation, visualisation, and prototyping are not part of most business-school curricula.
- The structure of business-school classes and design classes is very different.
- Ethnographic research often feels ‘fuzzy’ or ‘soft’ to business students who are primarily data-driven.
- Creativity, which is fundamental to design, is not empathised or taught at most business schools.
- Business school students exposed to design thinking may have a creative awakening.

Design Thinking and Business Thinking

- The design world and the business world often dismiss each other’s perspectives.
- Business thinking is guided by what is familiar, predictable, productive, and rewarding in the short term. It is reliability-based.

- Design thinking is guided by the opportunity to broaden and reframe the situation, reconceive what is possible, and resolve it through creative means. It is validity-based.
- Design thinking is human-centric, while business thinking is oriented towards command and control.
- Business thinking needs to embrace design thinking in order to help business leaders create new value that cannot be found through analysing the past.
- Problem-solving, based on analysing the past, is often categorised by type of solution rather than type of problem.
- Business thinking often exploits existing knowledge and conditions, which can lead to mastery of the situation.
- Design thinking explores unknowns and moves to create new knowledge, which can lead to originality.
- Design thinking and business thinking are both process-oriented.
- The opportunity to merge different knowledge perspectives can be seen as a significant condition for innovation.
- Qualitative approaches in the discovery and creation phases of innovation, as well as quantitative approaches in the scale and execution phase, all contribute to the knowledge needed to be innovative.
- Design and business co-creation are critical to the enterprise viability in an increasingly complex and global world.
- Cross-disciplinary approaches can inform individuals and organisations as well as enable more and better innovation through seeing and act more holistically.

Design-Based Learning for Business

- In order to be competitive, business should adopt a design attitude and approach; however, current education strategies produce a knowledge gap between design and business.
- The primary objective of higher education is the discovery and creation of new knowledge or the advancement and contribution of newly created knowledge. A design thinking approach in business education provides a platform for generating new knowledge and advancing knowledge through qualitative means that are inheritably different from those utilised in the business school.
- Continuous innovation is viewed as a key to competitive advantage for business; however, systematic and familiar approaches, which often do not include design thinking, are predominantly used to innovate in school and in practice.
- Design thinking is multi-epistemic and uses multiple ways of knowing, including thinking, feeling, sensing, and intuiting—all of which can inform business education and practice approaches.
- Design thinking in business education is not a product of discourse but rather an approach learned through doing and experiencing.
- Today's knowledge-based economy could benefit from design thinking competencies such as qualitative thinking, speculation, ideation, and prototyping.
- Ideally, innovators would be t-shaped, in that they have depth in one domain and breadth in many others. This would position innovators to best tackle complex challenges.
- Modern organisations need professionals who have multi-faceted competencies.

- Design thinking can be considered a change tool, further supporting its competitive advantage for a business world seeking continuous innovation.
- Design can influence perception, which can influence customer satisfaction.
- If education could be the catalyst for an integration of design and business, a new kind of leader could emerge.
- Collaborative learning approaches will be required for design and business to integrate.
- Design thinking needs to be learned and nurtured through qualitative project-based activities that are often not directly relatable to scientific approaches found prolifically in business school.
- The favourable condition for cross-pollinated design and business learning would be a studio environment, which is prevalent in traditional design education.
- A studio approach to learning inspires experimentation and iteration, and the combination of design and business in such an environment could lead to breakthroughs of new knowledge.
- The studio environment for these two different worlds, design and business, must be inclusive and respectful of the skills that both bring.
- The studio environment, which is a community of practice, is totally different from the environments for learning in business schools.

2.5.3 United States Business School Context and Curriculum

Business-School Context

- The MBA was initiated in the United States and has provided models for many institutions beyond the United States. This focus of this study is restricted to business schools in the United States.
- The Master of Business Administration (MBA) was first launched in 1921 and has a long history of being the ‘required’ degree for business management.
- The universal MBA curriculum was reframed to be more scientific in nature after a report found programmes granting an MBA were not generally rigorous.
- The scientization of business schools followed the social science model where rigour overrode relevance.
- Business-school faculty often study business at a distance and believe business to be science-oriented.
- Business schools have what is called ‘physics envy’, in that they attempt to utilise mathematical expressions to shape ideas in an effort to position and validate them within the world of science.
- Science-based educational approaches are often critical of liberal-arts approaches.
- Business schools historically have been guided by strict rules of engagement and are rigorously focused and linear in process, all supporting a scientific approach.
- Business-school approaches are often excessively analytical, utilizing predominantly quantitative techniques.
- There is often a deficit in generative, lateral, and innovative thinking skills in business schools.

- Business students often struggle with unstructured problems, ambiguity, and change, all of which are common in today's emerging industries and nascent markets.
- Business-school students are predominantly taught and learn through structured lectures and case studies, which is a passive approach.
- Experiential learning through project-based experiences is not commonplace in business schools.
- Integration skills, which include diverse points of view, shifting perspectives, and problem-framing and -reframing are often lacking in business schools.
- Acting both creatively and innovatively, such as problem-framing and -reframing, engaging in generative and lateral thinking, and experimentation are often lacking in business schools.

Business School Backgrounds and Curriculum

- Harvard University launched the first Master of Business Administration (MBA) in 1921 and is consistently regarded as the top-rated business school in the United States.
- Of the top-ten rated business schools in the United States, traditional teaching approaches such as the case-study method and lectures dominate the pedagogy. The minimum percentage of traditional teaching approaches is 80% from the Yale School of Management, while the maximum percentage is 95% from Harvard.
- Experiential learning approaches, which are predominate in design thinking, are not widely used in business schools. Harvard, the top-rated business school in

the United States, only utilises 5% of their pedagogy around experiential learning.

- The Massachusetts Institute of Technology (MIT) Sloan School of Business has the highest rate of experiential learning opportunities at 20% of their pedagogy, within the top-ten business schools in the United States. It does not have a design thinking offering within its core business-school offerings.
- The case-study method, pioneered by Harvard University, is widely used in business schools. A business case is presented to the student, in which they must read, evaluate, and chose a path that 'best' addresses the business issue. The cases are done as simulations based on historical information and are conducted in isolation from the actual stakeholders and conditions. The objective is to develop and test the student's analytical and communication skills.
- The case-study method is not human-centric and does not involve real-time discovery research, problem framing or reframing, ideation, prototyping, and iteration.
- The case study method is singular-solution driven, in which debate and persuasion are used to defend and promote the solution.
- Harvard business students read over 500 cases over a two-year period.
- The lecture method is widely utilised by business schools and is focused on the academic member's wisdom and presentation skills. It is dialogue-driven, with the academic member being front and centre.
- Most business-school class sizes range from 60-90 students.

Business School Required Core Curriculum

- All business schools rated within the top ten in the United States have a fixed core of business classes that are required. The remaining classes are considered electives, which students fill with topics that they want to further master within the business school.
- All business schools rated within the top ten in the United States require a fixed core that includes finance, accounting, microeconomics, analytics, strategy, leadership, operations, marketing, and decision sciences. The core is primarily quantitatively analytical.
- Only three business schools rated within the top ten in the United States have a design thinking component within the core business curriculum.
- The Kellogg School of Management at Northwestern University has a full-credit design thinking offering that is only offered to a specialised group of MBAs. This class is core to that group of 60 students but not core to the remaining 418 students in the business school. The course, Research-Design-Build (RDB), is experiential and project focused. The course is studio-based.
- The Hass School of Business at the University of California Berkeley has a half-credit design thinking course offering that all 250 business students take. It primarily uses lectures, cases, readings, and small class projects. The course, 'Problem Finding—Problem Solving', is not studio-based.
- The Yale School of Management at Yale University has a half-credit design thinking course offering that all 334 business students take. It primarily uses lectures, cases, readings, and small class projects. The course, 'Innovator', is not studio based.

- Of the three schools that offer a design thinking course within their respective business schools, all three have different pedagogies and learning environments.

CHAPTER 3

Theoretical Perspective / Methodology and Research Methods

Chapter 3: Theoretical Perspective/Methodology and Research Methods

3.1 Introduction to Theoretical Perspective/Research Methodology and Methods

The chapter introduces the theoretical perspective and research methods utilised for this study. It includes an overview of participant backgrounds as well as the background of the Kellogg School of Management at Northwestern University, which served as the primary laboratory for much of this research.

The researcher establishes his ontological and epistemological positions, viewing the world through the lens of constructivism.

Methodologically, the study focused on understanding matters arising from the main research question—Do business students value design thinking and if so, how might they learn it? The study aimed at understanding; therefore, it is predominantly a qualitative approach. Specifically, the focus of the research itself is viewed as a place of change in an academic setting, and as such, the main practical approach was action research—a well tried method for pedagogical improvement.

Furthermore, the course of development of the research methods used is best described as iterative and responsive to what was discovered as the study progressed. As such, this course of development led to early successive surveys and interviews being improved over time. Additionally, there was an element of mixed methods (i.e., some numeric data) in the service of understanding. Overall, the methods comprised of the following:

- Surveys of business students' attributes and attitudes
- Interviews with business students
- Interviews with academic members

Figure 5 illustrates the iterative and responsive methods used over time.

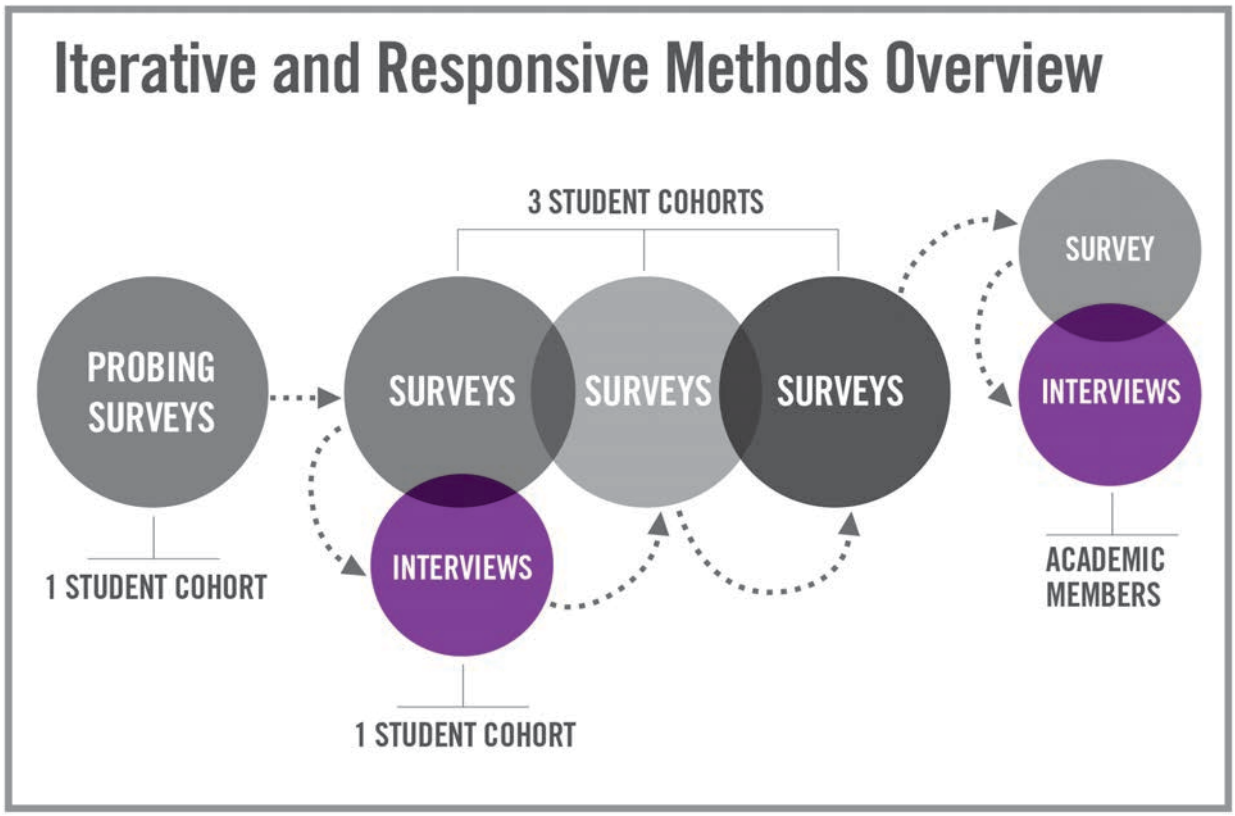


Figure 5. Iterative and Responsive Methods Overview

3.1.1 Research Foundation

The researcher's core assumptions have a distinct bearing on the nature of the research that is to be conducted, including research questions, the selection of methods, and the kinds of outcome that can be expected (Grix 2010). Establishing the researcher's ontological and epistemological positions may be seen as forming the foundations for

the research to be conducted (Grix 2010). Methodologically, this researcher has chosen qualitative action research. Action Research is well suited to the discipline of education (Savin-Baden and Major 2013).

This approach is underpinned by this researcher's ontological and epistemological positions. The ontological assumption a researcher makes is based upon the study of being, and is concerned with what is (Crotty 1998). Such assumptions focus on what we think makes up reality from a social reality perspective, based upon ideas about what currently exists and what the social reality perspective looks like (Blaikie 2000; Hughes and Sharrock 1997), and are concerned with the nature of the social reality perspective to be investigated (Hay 2002; Lewis 2002). Therefore, this researcher's ontological position is that business students attending the Kellogg School of Management bring with them little understanding or experience with empathy and design thinking before commencing their MBA, and, in general, United States business schools are not universally educating business students in design thinking.

The epistemological position a researcher takes is based upon what is known and how do they know it (Crotty 1998; Grix 2010; Guba and Lincoln 1994). Epistemology is concerned with how knowledge can be created (Cohen, Manion, and Morrison 2007) and questions the relationship between the actual researcher and the opportunity space of what can be understood (Guba and Lincoln 1994).

Consequently, this researcher's epistemological position is that of a constructivist, which may be seen to be part of interpretivism (Collins 2010). As such, this researcher

sees the world as subjective and socially constructed (Collins 2010; Easterby-Smith, Thorpe, and Lowe 1991) and seeks to understand social realities based primarily upon data gathered through the opinions of the participants.

3.1.2 Research Aims

The purpose of this study is to examine and understand the following;

- To understand the students' backgrounds in analytics and creativity, their quantitative and qualitative data experience, their notions of empathy, and their abilities to relate to design thinking before business school and prior to taking the design thinking class
- To understand the students' experience with a design thinking approach, their current environments for learning, and if they use empathy and to inform their decisions through the use of user data, and the context for learning design thinking after having taken the first design thinking class
- To understand what is important for students when learning to be a design thinker from peer academic members who teach design thinking at business school institutions other than the Kellogg School of Management at Northwestern University
- To understand the students' experience before and after a module entitled Research-Design-Build, the difficulties in learning, and the value they place after their design thinking experience during this module in relation to the following specific design thinking elements: ethnographic research, empathy, identifying the right problem to solve, framing the right problem to solve,

visualizing ideas, developing more than one solution, storyboarding, prototyping, iterating solutions, critique, creativity, and studio culture

- To understand the value the students place on design thinking as a differentiator and a competitive advantage after having taken the design thinking class Research-Design-Build
- To understand in greater depth, from peer academic members, how design thinking was utilised at their universities, its importance in business school education, the understanding and impact of design thinking in the decision-making processes of their students, success stories, struggles, and the overall value of the topic

3.1.3 Methodology

The researcher conducted this study as a responsive action researcher through the philosophical paradigm stance of constructivism, and the research approach was conducted using an immersive qualitative research lens to enable understanding of the background, problem, and opportunity.

Action Research Approach

Action research is the most appropriate for this study as it is predicated upon contextual experiences. Savin-Baden and Major (2013) defined this method as a qualitative research with the purpose of problem-solving through data gathering and reflection in the service of improving and understanding practice, most often in the realm of education. This was built upon the many attempts to classify the numerous traditions of action research by past scholars (see Crooks 1988; Gardner 1974; Holter and Schwartz-

Barcott 1993; Masters 1995). Savin-Baden and Major (2013) argued that what is critical to action research is that the focus of the research itself is viewed as a place of change, which is informed by numerous contextual participants, while the focus of action research is the concept of transformation. They further claimed that action research is often focused on structures and process associated with programmes, with the purpose of improving them.

Table 10. Responsive Action Research: Essential Features and Elements (Savin-Baden and Major [2013] framework for responsive action research)

Action Research Approach

Essential Features and Elements

TYPE	COMMONLY ADAPTED PARADIGMS	FOCUS	KEY FEATURES	DISCIPLINE
Responsive	Constructivism	The sharing of personal constructions in order to reach shared understanding.	Events are understood in terms of the ways that they are socially constructed – understanding, exploring and challenging power and control, while ensuring change for the better.	Education

Further, Lewin (1946) claimed that the research required for the purposes of social practice can be seen as research utilised for social management or social engineering. This form of action research is based on the elements of social action. Additionally, Bogdan and Biklen (1982) claimed that this form of research is intended to inform social change, while Kemmis and McTaggart (1988) reported action research as self-

reflective enquiry, which is gathered in social situations by participants in order to better their social or educational practices. Additionally, they seek to understand those particular practices and situations in which the engagement is facilitated. Kemmis (2010) also stated that action research is oriented toward transforming practices through contextual understanding. The approach, according to Elliott (1991), is sequential and is built upon interpretation. In summary, action research qualitatively seeks to understand social practices, in particular within education, and to improve them and how they are facilitated.

3.1.4 Constructivist Paradigm

The constructivist paradigm/philosophical point of view, which the researcher utilised, claims that research is rooted in the fact that people construct a sense of meaning through engagement of experiences that they are interpreting. They do so based on historical and social perspectives that can be captured by the research most effectively through personal in-context gathering of the information. Crotty (1998) proposed that the generation of meaning is always social, coming from interaction with people. Additionally, Creswell (2014) claimed that a constructivist believes people look to understand society in which they actively participate through daily activities in a personal and work context. People develop subjective meanings of their experiences based on context. These meanings are often varied and can be layered with complexity, and as such, it is critical that the researcher remains patient in the process and embrace the complexity of perspectives rather than forcefully narrowing in predetermined categories. Weber (2010) further reported that the constructivist point of view is pragmatic.

In summary, a constructivist approach is one in which the researcher seeks to understand experiences and people in the context of their daily activities and lives and makes sense of it.

3.1.5 Qualitative Research

As constructivist and action-research approaches privilege the contextual and lived experiences of participants, a focus on qualitative research, with its focus on human experience and interpretation, is the most appropriate for this study. Qualitative research is a natural process of discovery, often leading to meaningful insights, which are a result of human-centred dialogues and observations conducted in natural settings that allow for both articulated and unarticulated views and actions to contribute equally to a research outcome. Qualitative research is also called naturalistic inquiry and, as Malterud (2001) reported, qualitative research was designed within human and social sciences, which often refers to concepts in interpretation (hermeneutics) and human experience (phenomenology). The researcher interpreted the insights just as a designer would when utilizing this approach in the practice and delivery of human-centred design. Creswell (2014) further claimed that a qualitative researcher collects data first-hand through engaging research participants in the field through multiple inputs such as observations and interviews. The inputs gathered are then synthesised into categories through identified patterns that cross all input research sources.

The nature of this qualitative research is thus subjective as its orientation is personal and is reliant on individual views, orientations, perceptions, and circumstances, rather than scientific cause and effect testing. As Savin-Baden and Major (2013) claimed, truths are not always apparent and waiting to be discovered, and that qualitative researchers often

describe how they come to understand and know the realities of their participants over time. The researcher acknowledges the subjectivity of the insights as they are often deeply personal, individual, and rooted in the social world.

In addition, Caelli, Ray, and Mill (2003) stated that qualitative research is pragmatic and will have characteristics of a qualitative endeavour. Furthermore, the intent of the research is on understanding experiences or events in context.

Thus, the combination of a constructivist paradigm (seeking to understand and make sense of contextual experiences of people within their daily activities and lives), action research (understanding social practices such as education and to improve them and how they are facilitated), and qualitative research (contextual field discovery using a variety of methods) enabled participants' contextual, lived experience to emerge.

3.2 Methods

To capture the contextual views of the participants, a mixed methods approach was used, (see Johnson, Onwuegbuzie, and Turner 2007; Mason 2002) which included non-probability purposive sampling (Black 2010) through the use of quantitative indirect surveys and qualitative directed, semi-structured interviews as the basic method of understanding. Candidate selection of participants was based on the researcher's access to three MBA cohorts at the Kellogg School of Management—as an academic member of staff at Northwestern University, The Kellogg School of Management at Northwestern University, this researcher was provided a unique opportunity and access to students. The access came through the prototype class, Research-Design-Build

(RDB). In addition, participants were recruited from academic members of staff who teach design thinking at a selection of U.S. business schools. In total, the same 180 students and five peer academic members of staff participated in surveys and interviews over a four-year period.

3.3 Research Design

3.3.1 Survey Design—Likert Scale

Students and academic members participated in a total of five surveys and were asked to respond to specific statements, specifying their level of agreement or disagreement based on an agree-disagree scale. The form of measurement used was a Likert Scale, which was developed by Rensis Likert (1932). Likert developed a way of gathering and measuring the attitudes of people, asking them to respond to statements about a particular subject. The approach enabled Likert and future researchers to measure the cognitive and affective components of people's attitudes. A Likert Scale utilises a fixed-choice response format with the intent of measuring opinions or attitudes toward a subject (Bowling 1997; Burns and Grove 2005). This bipolar scaling method measures the levels of agreement or disagreement, expressed most often on a five-point scale, allowing the individual to share how strongly they agree or disagree with the content (Allen and Seaman 2007).

Data were summarised using the values of each selected option and the creation of a score for each statement. This score was then used to represent a specific trait.

- Surveys 1 and 2 used a five-level Likert Scale—Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.

- Surveys 3, 4, and 5 evolved and used a seven-level Likert Scale—Entirely Agree, Mostly Agree, Somewhat Agree, Neutral, Somewhat Disagree, Mostly Disagree, Entirely Disagree.

Based on the number of participants responding to each specific level of agreement or disagreement, a percentage number was generated.

3.3.2 Interview Design

Two different interview guides were developed—one specifically for business student participants, and the other specifically for academic member participants. Both were semi-structured with open-ended questions. In total, 25 students and five academic members took part in the interviews.

The student interviews sought to understand qualitatively in greater depth the background of the students, their business school academic experience, their experience of the module Research-Design-Build (RDB), and their overall experience with the teaching, learning, and language used in design thinking. This qualitative experience allowed the students to expand upon survey topics that they had already participated in.

The academic member interviews sought to understand in greater depth the participants' understanding of how design thinking was utilised at the participants' universities, its importance in business school education, the understanding and impact of design thinking in the decision-making of their students, success stories, struggles, and the overall value of the topic.

3.4 Ethical Framework

3.4.1 Coventry University Certificate of Ethical Approval

This research was approved as low risk and was granted a Certificate of Ethical Approval from Coventry University.

- Project Reference Number: P26519

Approval notification can be found in Appendix A.

3.4.2 Institutional Review Board (IRB) Approval

The Institutional Review Board (IRB) applies research ethics by reviewing the methods proposed for research, ensuring accordance with all federal, institutional, and ethical guidelines in the United States. Protocol review evaluates the ethics associated with the research and its methods. Additionally, IRB promotes voluntary participation and the safety of the participating subjects. Research approval, modifications in order to secure approval, or disapproval, is within the authority of the board.

IRB approval was required of this research, as it was conducted primarily at Northwestern University and solely within the United States. The research was determined to be 'exempt' and granted IRB approval from the office of research at Northwestern University (irb.northwestern.edu).

- IRB study number: STU201508

Approval notification can be found in Appendix B.

3.4.3 Risk Management

There are some risks that could have had an impact on this action-research approach with respect to student participants. First, getting business students to volunteer for academic research, when they already have busy academic and job recruiting schedules, could have been difficult. Students may also have viewed participation as having an impact, either negatively or positively, on their grades and standing at the university. Survey risk was managed in the following ways:

- Participation was made completely voluntary.
- Participants were assured of their anonymity.
- A limited number of surveys were used—five.
- A limited number of questions were used to ensure ease of navigation and engagement.
- Clarification was provided that there was no right or wrong answer—the participant was the 'expert'.
- Surveys were conducted independently of the class Research-Design-Build (RDB).
- Surveys were conducted online to ensure ease of access, flexibility of completion, and lack of peer pressure.
- Surveys were administrated by a neutral party (staff administrator) and not the researcher.

In addition to the above, risk was managed for the student interviews in the following ways:

- A limited number of interviews were conducted—one.
- Interviews were conducted in-person—public location, private conference room.

- Interviews were recorded—students were given the option to review transcript and edit if so desired.
- Students could choose to not answer a question.
- Students could withdraw from the interview, in progress, if uncomfortable.

For the academic member interviews, the risk was primarily related to scheduling. The academic members who were selected and volunteered for this study had limited time and access, based on their teaching, research, speaking, and travel demands.

Thus, as well as the risk management points listed above, this interview risk was managed in the following ways:

- A limited number of interviews were conducted—one total.
- Interviews are conducted by phone—ease of remote access.

3.5 Sampling and Recruitment of Participants

3.5.1 The Primary Research Setting

When unpacking the thesis question—'Do business students value design thinking and if so, how might they learn it?'—it was determined that understanding this question would be best studied in the context of one of the leading business schools in the United States. As an academic member of staff at Northwestern University, The Kellogg School of Management at Northwestern University, this researcher was provided a unique opportunity and access to students. The access came through the prototype class, Research-Design-Build (RDB).

A private research university founded in 1851, Northwestern University (NU) has campuses in Evanston, Illinois, and Chicago, Illinois, in the United States, as well as in Doha, Qatar. It is recognised nationally and internationally for its educational programmes, recruiting diverse students of academic achievement. Furthermore, 90% of applicants rank in the top 10% of their high school classes, with National Merit Scholar enrollment among the nation's highest. Total student enrollment is 21,000, with $550 million in annual sponsored research. Northwestern University is ranked 13th nationally by *U.S. News and World Report* (it is currently ranked as 11th nationally by *U.S. News and World Report* [2018b]—tied with Dartmouth College and Johns Hopkins University).

Furthermore, Northwestern University admissions is characterized as one of the most selective schools in the United States. The university has over 32,124 applicants for the 2019 class, with only13% admitted. Additionally, SAT scores ranked in the top 10% of their high school class (Northwestern University Admissions n.d.).

The Kellogg School of Management is the business school at Northwestern University. Founded in 1908, the school has historically been ranked as one of the top business schools in the world.

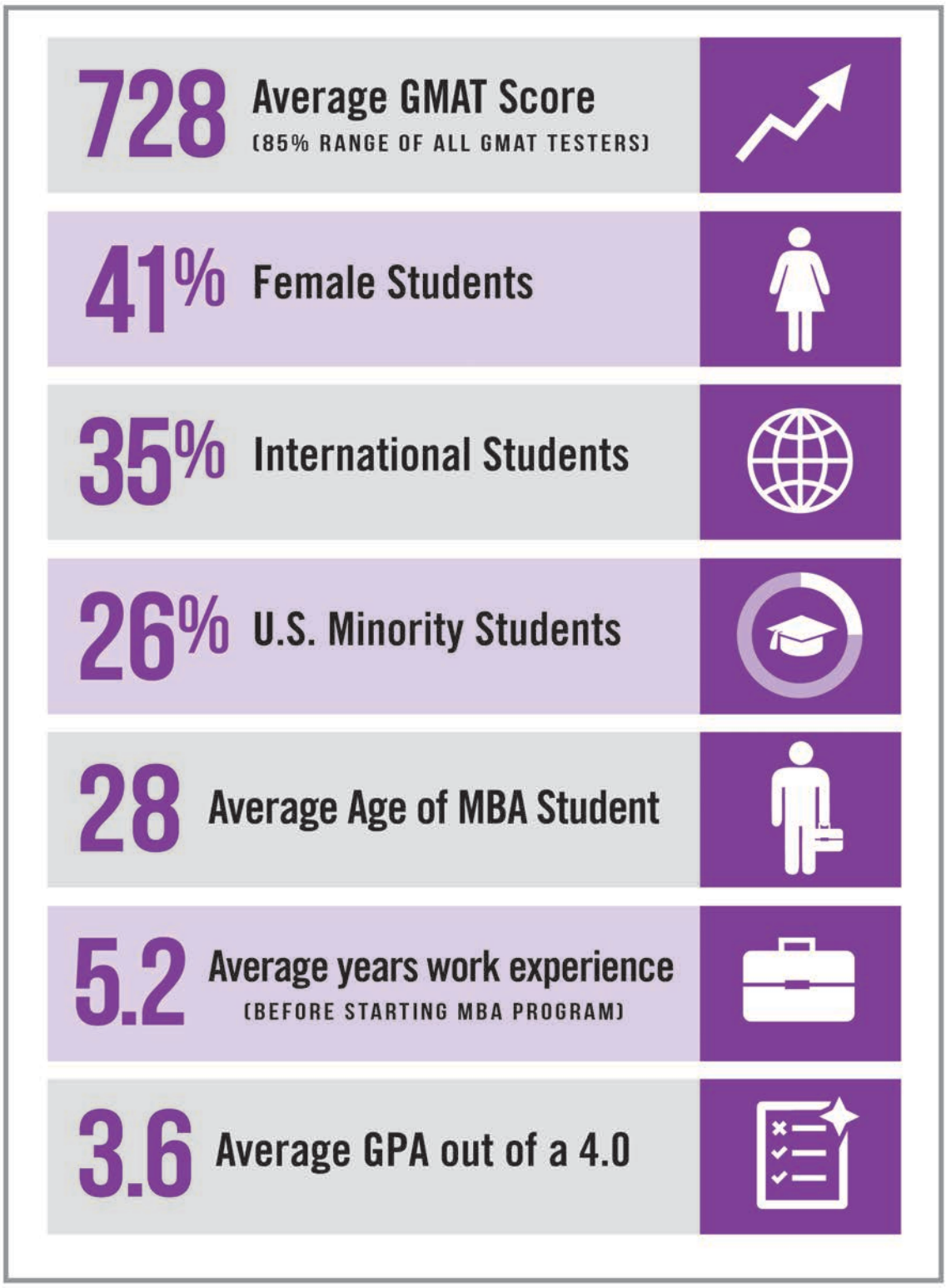
- *U.S. News and World Report* ranked The Kellogg School of Management 6th best business school nationally in 2016 (it is currently ranked as the 4th best business school nationally by *U.S. News and World Report* [2018a]—tied with MIT and Stanford).
- The school receives 4,652 applications per year and has an acceptance rate of

23.2%.

- The school has an annual enrollment of 1,047 students per year, which includes students in the one-year executive programme and the full-time 2-year programme.

The student profile overview and student industry backgrounds can be found in Table 11 and Figure 6, respectively, below:

Table 11. MBA students' overall background



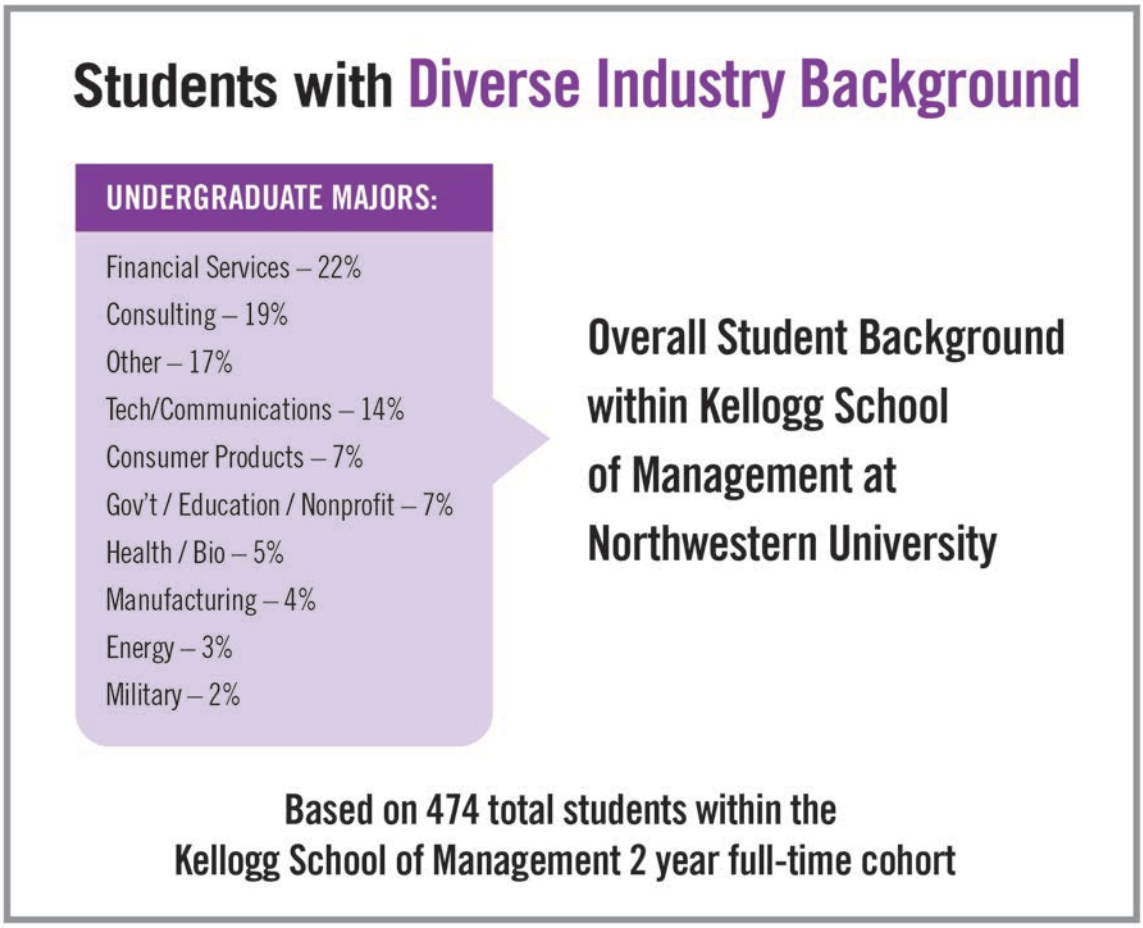


Figure 6. MBA students' Overall Industry Background

Within the business school, design, design thinking, and design innovation are not identified within the concentrations and specialisations at the school. Research-Design-Build (RDB), a prototype course at the time the study was started, was the only design thinking course offered in the business school, and it was not mandatory. The following figure illustrates the student Research-Design-Build (RDB) participation within the business school:

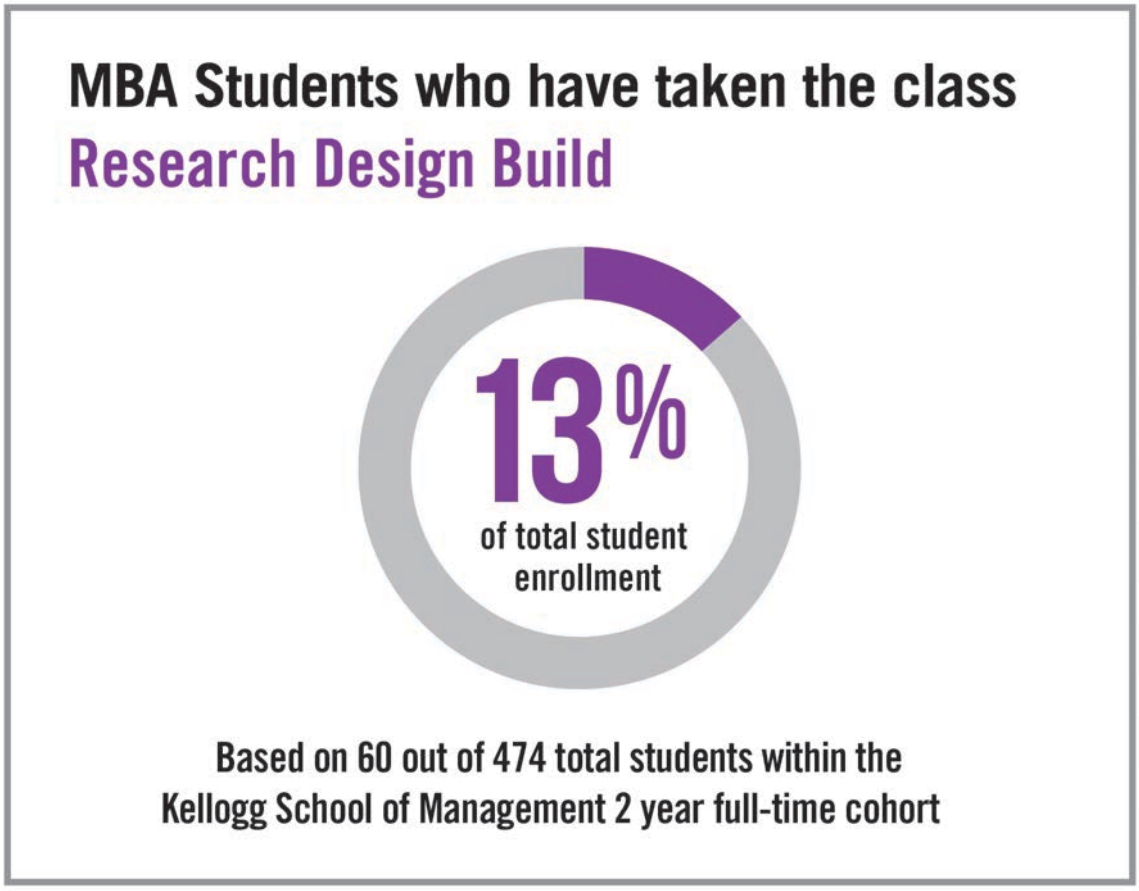


Figure 7. MBA Students Who Have Taken the Class Research-Design-Build (RDB)

Required Kellogg Master of Business Administration (MBA) Core Courses

All business students are required to take the following courses

(kellogg.northwestern.edu):

- Marketing Management
- Accounting
- Business Analytics
- Operations
- Leadership for Organizations
- Business Strategy

- Finance 1
- Finance 2
- Microeconomics
- Values and Crisis Decision Making

Concentrations and Specialisations Within the Business School

Within the MBA curriculum, the following are specific pathways around which students can build out their remaining coursework (kellogg.northwestern.edu):

- Accounting
- Corporate Social Responsibility
- Economics
- Entrepreneurship
- Finance
- General Management
- Health Care Administration
- Human Resource Management
- International Business
- Marketing
- Media/Entertainment
- Operations Management
- Organizational Behavior
- Real Estate
- Statistics and Operations Research

- Strategy
- Decision Sciences; Managerial Analytics

3.6 Research Participants

3.6.1 Student Participant Backgrounds

The respective backgrounds of students are represented in the following figures:

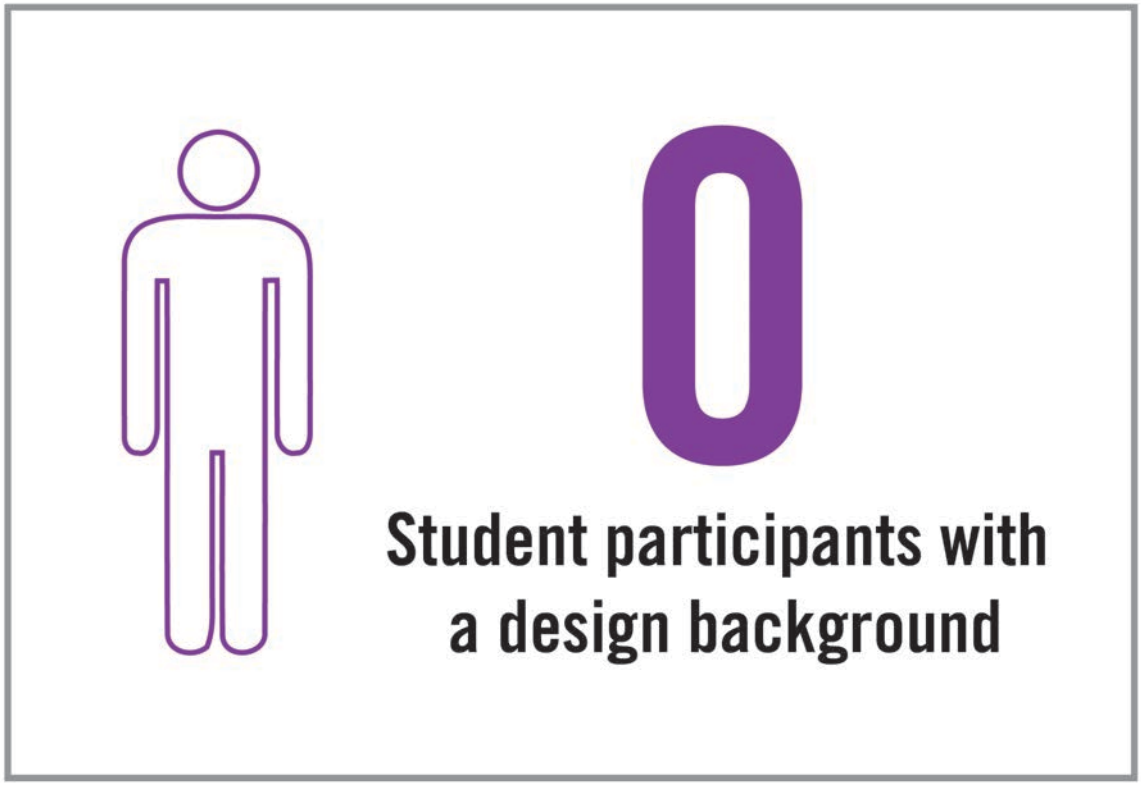


Figure 8. MBA Students Who Have a Design Background

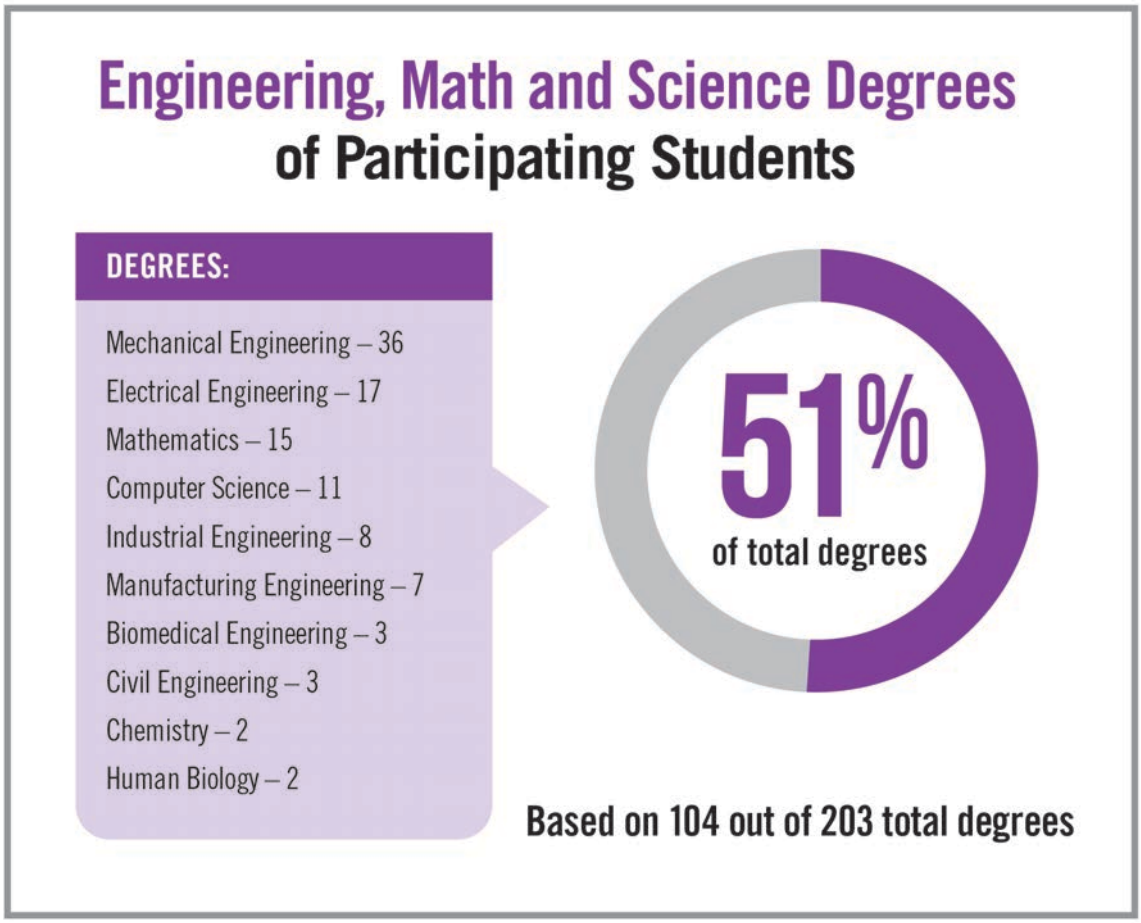


Figure 9. MBA Students with an Engineering, Math, and Science Background

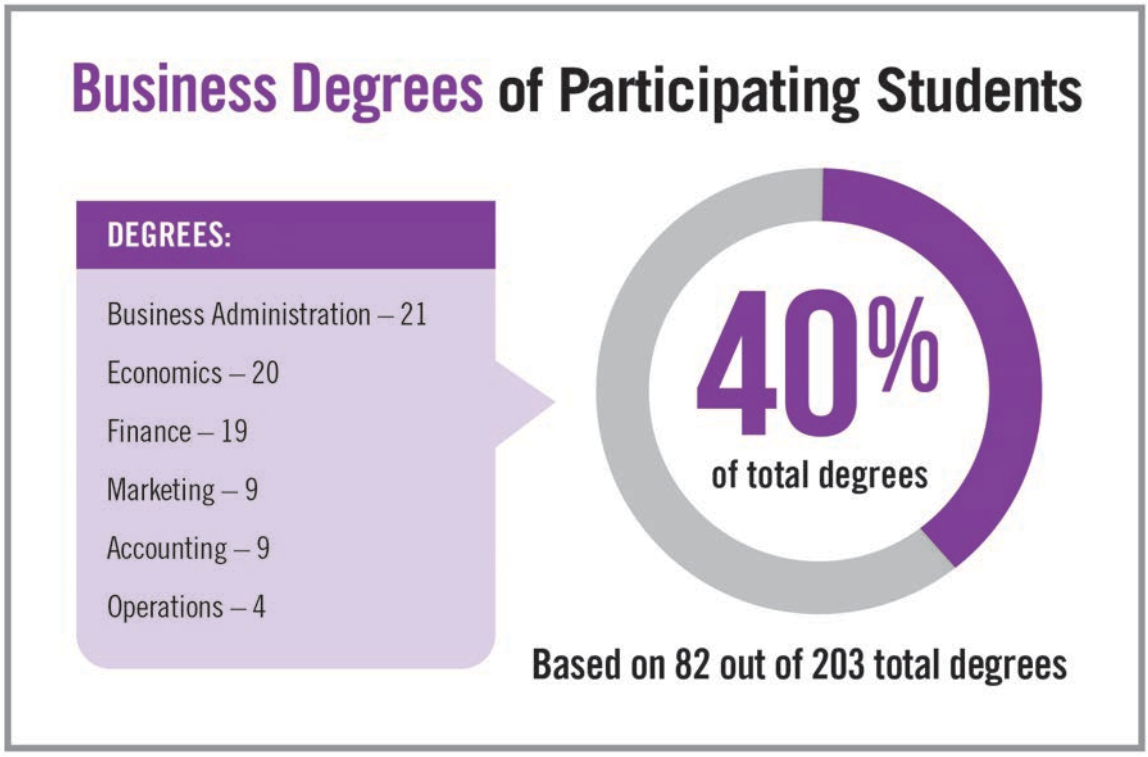


Figure 10. MBA Students with a Business Background

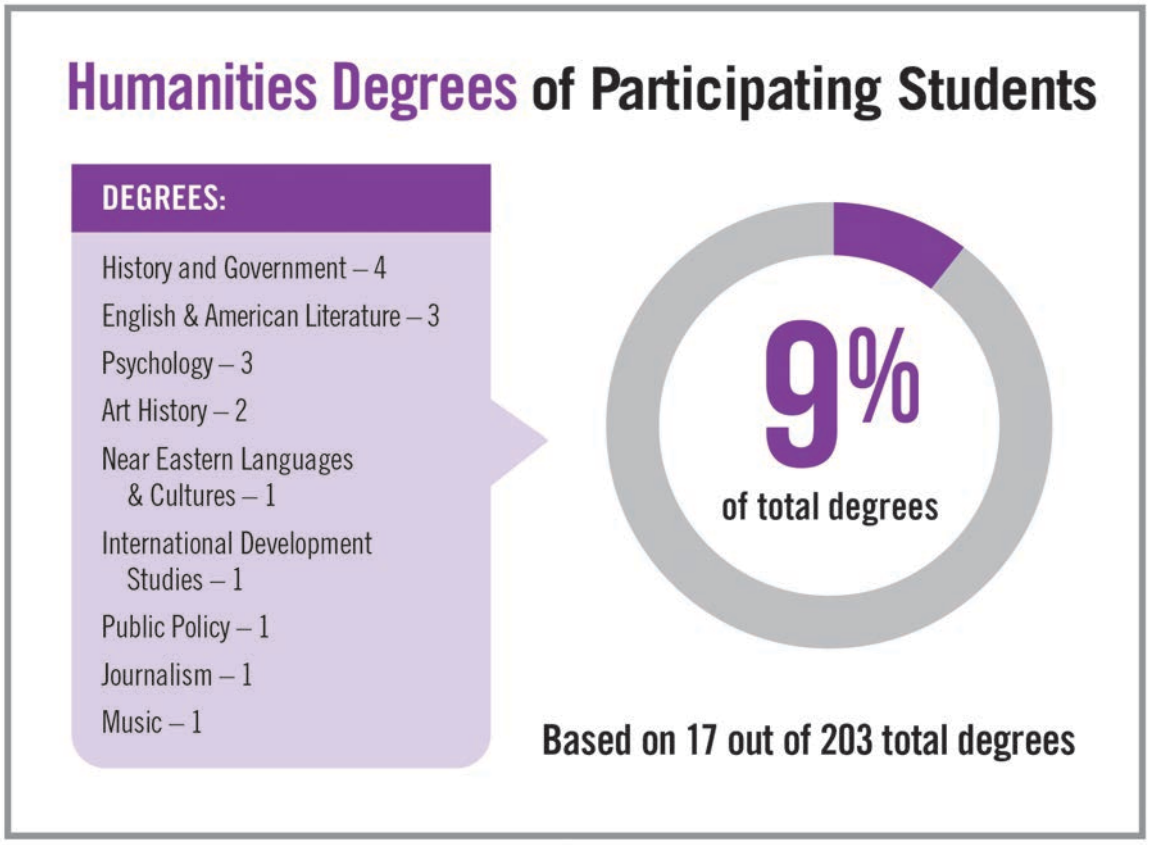


Figure 11. MBA Students with a Humanities Background

3.6.2 Student Surveys

The researcher publicly stated that he seeks to understand the role and value of design thinking in a business-school context as part of an independent academic research study. Additionally, the researcher publicly stated and stated on documentation pertaining to the research that participation in the study is voluntary and would have no bearing on course grades or university standing.

The goals of the surveys were first to understand the students' backgrounds with design thinking, empathy, and innovation before taking the class Research-Design-Build

(RDB), and second to understand a broader range of topics around design thinking, learning, and value after having taken the class.

- A total of 4 surveys, administered by an independent party and not the researcher, were conducted. This platform was viewed favourably by the student participants due to flexible access and time allocation. Online surveys are readily part of the business school culture and are often utilised by academic members of staff, administrators, and students. Participation in data collection via this format was viewed favourably.

Student Survey Participants

- Business students at Northwestern University who were enrolled in the prototype class, Research-Design-Build (RDB), or had completed the class participated in the research.
- Three cohorts of 60 students—180 in total—participated over a period of three years in the study.
- Students did not participate in the study while actually in the class.
- Among the total number (180) of MBA students from the Kellogg School of Management at Northwestern University participating in research surveys, 108 were male, 72 were female.
- Additionally, among the 180 participating, there were 26 international students:16 males and 10 females.

3.6.3 Student Interviews

The goal of this phase of the research was to gain a deeper understanding of the core question from business students after having just taken the design thinking course, Research-Design-Build (RDB). The information gathered from all participants was their individual opinions based on their experience in the classroom and in industry.

- One qualitative one-on-one interview each was conducted with 25 students for a total of 25 interviews. Students were invited to be interviewed, and from the volunteer pool, the researcher conducted a second level of purposeful sampling in order to specifically select participants who have primarily deep technical, analytic, or business backgrounds to participate.
- Among the 25 students participating, 14 were male and 11 were female.

The breakdown of student participants, including specific backgrounds, follows in Table 12, Table 13, and Table 14:

Table 12. Student Participant Backgrounds 1-10

Student Participant Backgrounds

STUDENT 1

- Gender: Male
- Undergraduate University: University of Michigan, U.S.
- Undergraduate Degree: Bachelor of Science in Electrical Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Engineer—Fiat

STUDENT 2

- Gender: Male
- Undergraduate University: Stanford University, U.S.
- Undergraduate Degree: Bachelor of Science in Mechanical Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Officer—U.S. Navy

STUDENT 3

- Gender: Male
- Undergraduate University: Indiana University, U.S.
- Undergraduate Degree: Bachelor of Science in Business (economics and finance focus)
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Technology Consultant—Deloitte

STUDENT 4

- Gender: Male
- Undergraduate University: University of Sussex, U.K.
- Undergraduate Degree: Bachelor of Science in Electronics Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: University of Sussex, U.K.
- Graduate Degree: Master of Science in Electronics and Communications Engineering
- Professional Experience: Engineer—Ericsson

STUDENT 5

- Gender: Female
- Undergraduate University: Southern Methodist University, U.S.
- Undergraduate Degree: Bachelor of Science in Mechanical Engineering
- Second Undergraduate Degree: Bachelor of Science in Mathematics
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Technology Consultant—Deloitte

STUDENT 6

- Gender: Male
- Undergraduate University: University of South Carolina, U.S.
- Undergraduate Degree: Bachelor of Science in Business Administration
- Second Undergraduate Degree: Bachelor of Science in Finance
- Undergraduate Minor: Mandarin Chinese
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Private Equity—BB&T Capital Markets

STUDENT 7

- Gender: Male
- Undergraduate University: University of Virginia, U.S.
- Undergraduate Degree: Bachelor of Science in Systems Engineering
- Second Undergraduate Degree: Bachelor of Science in Mathematics
- Undergraduate Minor: Financial Mathematics
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Private Equity—Madison Dearborn Partners

STUDENT 8

- Gender: Female
- Undergraduate University: University of California, Berkeley, U.S.
- Undergraduate Degree: Bachelor of Science in Business Administration
- Second Undergraduate Degree: NA
- Undergraduate Minor: English
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Technology Consultant—Simon-Kucher & Partners

STUDENT 9

- Gender: Male
- Undergraduate University: Georgia Institute of Technology, U.S.
- Undergraduate Degree: Bachelor of Science in Systems Engineering
- Second Undergraduate Degree: Bachelor of Science in Mathematics
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Engineer—John Deere

STUDENT 10

- Gender: Female
- Undergraduate University: Federal University of Santa Catarina, Brazil
- Undergraduate Degree: Bachelor of Science in Mechanical Engineering
- Second Undergraduate Degree: Bachelor of Science in Mathematics
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Engineer—ArcelorMittal

Table 13. Student Participant Backgrounds 11-20

Student Participant Backgrounds (continued)

STUDENT 11

- Gender: Male
- Undergraduate University: BITS Pilani, India
- Undergraduate Degree: Bachelor of Science in Electrical Engineering
- Second Undergraduate Degree: Bachelor of Science in Mathematics
- Undergraduate Minor: NA
- Graduate University: BITS Pilani, India
- Graduate Degree: Master of Science in Physics
- Professional Experience: Program Manager—LSI

STUDENT 12

- Gender: Female
- Undergraduate University: Rensselaer Polytechnic Institute, U.S.
- Undergraduate Degree: Bachelor of Science in Civil Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: University of Texas at Austin, U.S.
- Graduate Degree: Master of Science in Environmental Engineering
- Professional Experience: Program Manager—International Resources Group

STUDENT 13

- Gender: Male
- Undergrad University: Texas A&M University, U.S.
- Undergraduate Degree: Bachelor of Science in Mechanical Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Engineer—Bray International

STUDENT 14

- Gender: Male
- Undergraduate University: Northwestern University, U.S.
- Undergraduate Degree: Bachelor of Science in Mechanical Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: Managerial Analytics
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Technology Consultant—DMC

STUDENT 15

- Gender: Male
- Undergraduate University: University of Notre Dame, U.S.
- Undergraduate Degree: Bachelor of Science in Mechanical Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Technology Consultant—Deloitte

STUDENT 16

- Gender: Female
- Undergraduate University: University of Maryland, U.S.
- Undergraduate Degree: Bachelor of Science in Finance and Operations
- Second Undergraduate Degree: NA
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Management Consultant—PricewaterhouseCoopers

STUDENT 17

- Gender: Male
- Undergraduate University: University of California, Berkeley, U.S.
- Undergraduate Degree: Bachelor of Science in Business Administration
- Second Undergraduate Degree: Bachelor of Arts in Economics
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Brand Strategy—Prophet

STUDENT 18

- Gender: Male
- Undergraduate University: Vanderbilt University, U.S.
- Undergraduate Degree: Bachelor of Arts in Economics
- Second Undergraduate Degree: Bachelor of Arts in Chemistry
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Management Consultant—IBM

STUDENT 19

- Gender: Male
- Undergraduate University: Brown University, U.S.
- Undergraduate Degree: Bachelor of Arts in Economics
- Second Undergraduate Degree: Bachelor of Arts in Chemistry
- Undergraduate Minor: NA
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Economic Consultant—Analysis Research Corporation

STUDENT 20

- Gender: Female
- Undergraduate University: Duke University, U.S.
- Undergraduate Degree: Economics
- Second Undergraduate Degree: NA
- Undergraduate Minor: African-American Studies
- Graduate University: Johns Hopkins University, U.S.
- Graduate Degree: Master of Science in Health Science
- Professional Experience: Digital Strategy—ICF International

Table 14. Student Participant Backgrounds 21-25

Student Participant Backgrounds (continued)

STUDENT 21

- Gender: Female
- Undergraduate University: New York University, U.S.
- Undergraduate Degree: Bachelor of Arts in International Relations
- Second Undergraduate Degree: NA
- Undergraduate Minor: Intellectual Property Law
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Analytics and Insights Consultant—MEC

STUDENT 22

- Gender: Male
- Undergraduate University: Vanderbilt University, U.S.
- Undergraduate Degree: Bachelor of Science in Civil Engineering
- Second Undergraduate Degree: Bachelor of Arts in Economics
- Undergraduate Minor: Intellectual Property Law
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Financial Product Sales—Western Southern Financial

STUDENT 23

- Gender: Male
- Undergraduate University: Duke University, U.S.
- Undergraduate Degree: Bachelor of Science in Mechanical Engineering
- Second Undergraduate Degree: NA
- Undergraduate Minor: Economics and Theatre Studies
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Engineering—Parkinson Technologies

STUDENT 24

- Gender: Female
- Undergraduate University: Marquette University, U.S.
- Undergraduate Degree: Bachelor of Science in Finance
- Second Undergraduate Degree: Bachelor of Science in Accounting
- Undergraduate Minor: Asset Management
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Management—Redbox

STUDENT 25

- Gender: Female
- Undergraduate University: Haverford College, U.S.
- Undergraduate Degree: Bachelor of Science in Finance
- Second Undergraduate Degree: Bachelor of Arts in Economics
- Undergraduate Minor: Philosophy
- Graduate University: NA
- Graduate Degree: NA
- Professional Experience: Management - Management Consultant—L.E.K. Consulting

3.7 Academic Member Interviews

The goal of this phase of the research was to gain a deeper understanding of the core question from academic members who teach design and or innovation-centric content in business schools to MBA candidates. The information gathered from all participants was their individual expert opinions based on years of teaching, publication, and speaking on the subject of design and innovation-centric content.

3.8 Academic Member Interview Participants

A total of three academic members from various universities were selected, as well as five academic members from within the Kellogg School of Management at Northwestern University. The selection criteria for these academic members was that they teach design-centric content in business schools rated in the top ten in the United States.

Academic members from two universities that were not rated in the top ten business schools in the United States were selected by way of snowball sampling. The term ‘snowball sampling’ is reflective of the analogy of a snowball growing as it rolls down a hill (Morgan 2008). According to Goodman (1961), snowball sampling is a non-probability sampling technique in which existing study subjects recruit additional participants who meet the criteria and who could contribute to the study.

In this case, the recruiting criteria were academic members with thought leadership reputations in design thinking in business through publication. These academic members, not traditionally trained as designers, teach design-centric content to MBA students at their respected initiations. These members were strongly recommended by others who fit the original criteria.

3.8.1 Participating Informants from Business Schools Ranked in the Top Ten (Purposeful Sampling)

The biographical information (bio) for each academic member was used with permission and adapted from the following sources, respectively: Stanford Graduate School of Business (n.d.), Yale School of Management (n.d.), and Berkley Haas (n.d.).

Academic Member 1: Consulting Associate Professor

Stanford Graduate School of Business—Stanford University

(2016 cumulative business school ranking—2nd)

Bio: Academic Member 1 also serves as the Chief Design Officer at SAP.

Design-centric course taught:

- Scaling Design

Academic Member 2: Associate Professor of Organizational Behavior

Yale School of Management—Yale University

(2016 cumulative business school ranking—10th)

Bio: Academic Member 2 researches the role of institutions in entrepreneurship and economic development. Specifically, he studies how individuals purposefully change complex organisations or systems. In particular, his work explores how individuals' backgrounds, professional identities, and organisational positions affect how they relate to existing structures and the strategies they pursue to change them. His work contributes to a deeper understanding of the mechanisms that allow institutions to operate and change. Academic Member 2 has done work in entrepreneurial finance and microfinance.

Design-centric course taught:

- Innovator's Perspective

Academic Member 3: Senior Lecturer

Haas School of Business—University of California, Berkeley

(2016 cumulative business school ranking—8th)

Bio: With over 30 years of industry and academic experience, Academic Member 3 is the director of the Management of Technology Program at the Haas School of Business at the University of California, Berkeley. In addition to teaching courses in her areas of expertise, which include new product development and manufacturing as well as operations management, Academic Member 3 has also initiated innovative new courses in design, new product development, and entrepreneurship.

Design-centric course taught:

- Design and Systems Thinking for MBAs

3.8.2 Participating Informants from Business Schools Not Ranked in the Top Ten (Snowball Sampling)

The biographical information (bio) for each academic member was used with permission and adapted from the following sources, respectively: the Darden School of Business (n.d.) and the Weatherhead School of Management (n.d.).

Academic Member 4: Professor of Business Administration

Darden School of Business, University of Virginia

(2016 *U.S. News and World Report*—11th)

Bio: Academic Member 4 is the United Technologies Corporation Professor of Business Administration and formerly served as associate dean of the MBA programme and as executive director of the Batten Institute. She teaches both MBAs and executives in the areas of design thinking, innovation, and leading growth.

Design-centric courses taught:

- Corporate Innovation and Design Experience
- Strategy as Design

- Strategic Thinking

Academic Member 5: Professor of Design & Innovation

Case Western Reserve, Weatherhead School of Management

(2016 *U.S. News and World Report*—71st)

Bio: Academic Member 5 is well known for extending the application of design into new areas of theory and practice, writing, and teaching as well as practising the concepts and methods of interaction design. A widely published author and frequent speaker, his books include *Discovering Design: Exploration in Design Studies, The Idea of Design,* and *Pluralism in Theory and Practice.* He is co-editor of *Design Issues*, the international journal of design history, theory, and criticism. Previously, he served for two terms as president of the Design Research Society, the international learned society of the design research community.

Design-centric course taught:

- Design in Management: Concept and Practices

3.9 Surveys and Interviews

Figure 12 represents an overview of participants in the primary research.

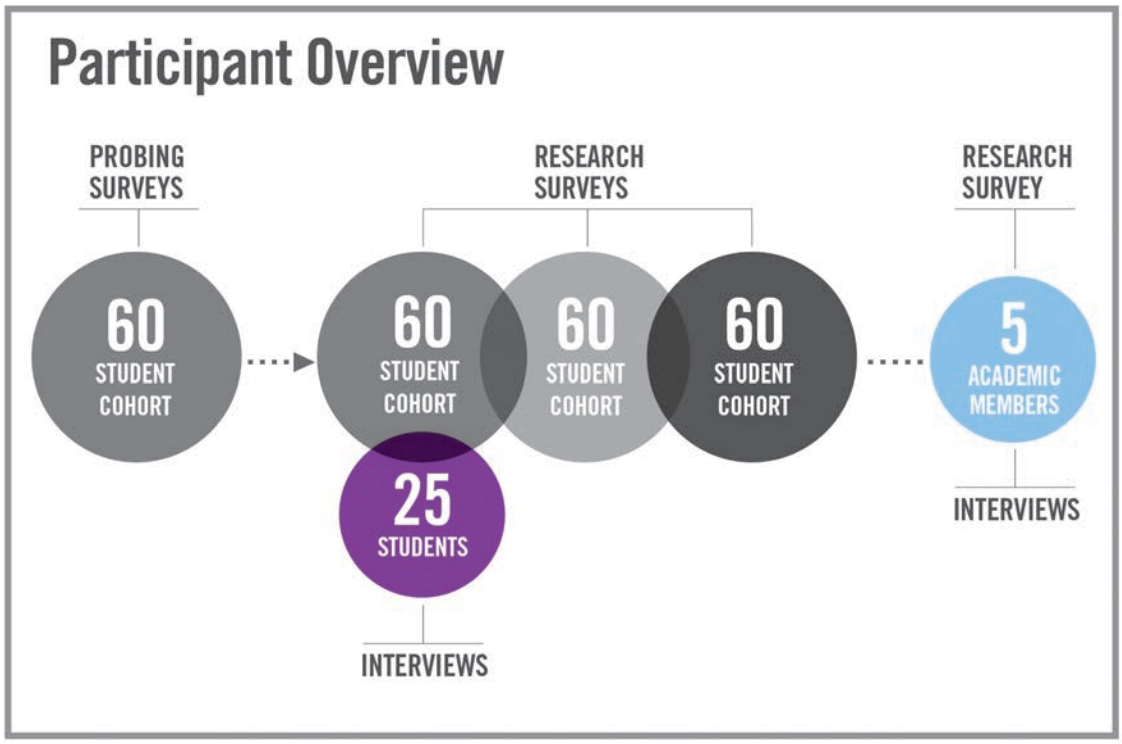


Figure 12. Research Participants

- The research was conducted and iterated over a four-year period, consisting of a series of surveys and interviews with business students and academic members.
- The students participating in the research consist of three cohorts of 60 students, for a total of 180 student participants. These cohorts are part of the two-year full-time MBA programme at Northwestern.
- Of the initial 60 student participants from Cohort 1, 25 student volunteers were interviewed in order to more deeply understand their backgrounds and perspectives on business school teaching, innovation, design thinking, and empathy.
- A total of 180 students participated in multiple surveys and one interview session, while only 120 total students participated in Survey 4, due to graduation.

- A total of 5 academic members participated in one survey and one interview.
- A number of probing surveys were conducted unofficially and were used to shape where to take the work. The information gathered as part of this work was not part of the formal research.

Table 15 provides an overview of the participants and phases of the primary research.

Table 15. Research Phases

Research Phases

Four Year Overview – Participants

PARTICIPANTS	PHASE 1	PHASE 2	PHASE 3	PHASE 4
Cohort 1	60 students			60 students
Cohort 2	60 students		60 students	60 students
Cohort 3	60 students		60 students	60 students
Peer Academics		5 academics		

<u>Phase 1: (180 students participated)</u>

- Survey 1—Pre-RDB (Research-Design-Build)

  To understand the students' backgrounds in analytics and creativity, quantitative and qualitative data, empathy, and design thinking before business school and prior to taking the design thinking class.

  Survey 1 can be found in Appendix D.

- Survey 2—Post-RDB

  To understand the students' experience with a design thinking approach, the environment for learning, how we inform empathy and decisions through data,

and the context for learning design thinking after having taken the first design thinking class.

Survey 2 can be found in Appendix E.

- Interview 1 (25 student subset participated)

  To understand in greater depth the background of the students, their business school academic experience, their Research-Design-Build (RDB) experience, and their overall experience with the teaching, learning, and language used in design thinking.

  Interview 1: Student Interview can be found in Appendix K.

<u>Phase 2: (5 academic members participated)</u>

- Survey 3—Learning to Be a Design Thinker

  To understand what is important for students when learning to be a design thinker from peer academic members who teach design thinking at business school institutions other than the Kellogg School of Management at Northwestern University.

  Survey 3 can be found in Appendix F.

- Interview 2 (5 academic members participated)

  To understand in greater depth how design thinking was utilised at their universities, its importance in business school education, the understanding and

impact of design thinking in the decision-making of their students, success stories, struggles, and the overall value of the topic.

Interview 2: Academic Member Interview can be found in Appendix O.

Phase 3: (120 students participated)

- Survey 4—Elements of Design Thinking

  To understand the students' experience before and after Research-Design-Build (RDB), the difficulties in learning, and the value they place after their design thinking experience with the following specific design thinking elements: ethnographic research, empathy, identifying the right problem to solve, framing the right problem to solve, visualizing ideas, developing more than one solution, storyboarding, prototyping, iterating solutions, critique, creativity, and studio culture.

  Survey 4 can be found in Appendix G.

Phase 4: (180 students participated)

- Survey 5—Design Thinking Differentiation and Competitive Advantage

  To understand the value the students place on design thinking as a differentiator and a competitive advantage after having taken the design thinking class, Research-Design-Build (RDB).

  Survey 5 can be found in Appendix H.

3.10 Data Analysis

3.10.1 Gathering Data

Survey data was gathered through the use of an online survey tool and transcribed into a Microsoft Word document by an individual other than the researcher.

Interview data was gathered through audio recordings and note-taking directly by the researcher at the time of the interviews. The audio recordings were transcribed into a Microsoft Word document by an individual other than the researcher.

QDA Miner data was captured through data outputs, transcribed into a Microsoft Word document by an individual other than the researcher.

All data gathered was backed up through cloud-based archiving software as well as a secondary hardware backup device.

3.10.2 Thematic Analysis

The technique of thematic analysis (Attride-Stirling 2001) was used to analyse the data. According to Braun and Clarke (2006), thematic analysis is a research methodology used to identify, analyse, and report patterns within research data. It is this form of analysis that seeks to find important themes by thoroughly organising the information and providing detailed descriptions. From this analysis comes emerging themes, which provide a systematic descriptive account of the various aspects of the topic. Repeated themes throughout the research constitute a pattern of importance and are validated through repeated occurrence in the interview set.

The survey data covers a vast array of topics, including background, empathy, innovation, qualitative and quantitative approaches, design thinking, design tactics, how to learn, what can be learned, and differentiated and competitive advantages. Initial insights from surveys informed the creation of further surveys and the framing of the questions to be asked in the student and academic member interviews.

Initial themes were identified in the surveys through percentages of acceptance, rejection, or neutrality. These helped to frame the coding used in the analysis of the interviews.

Making sense of the data involves synthesizing and interpreting what the participants have said, including what was heard and read by the researcher. The aim of this study is to examine how the interviewees respond to questions regarding the value of design thinking, teaching design thinking in business schools, and how business students learn design thinking best. The data collected for this study relates specifically to the interviewees' personal experiences as peer academic members teaching design thinking within their particular business schools. The analysis consists of the researcher going back and forth between description and interpretation. Insights obtained from the entire interview data-set analysis are part of the overall findings of this research, taking form as organised descriptive narratives and themes. Furthermore, a thematic analysis of the interview data was conducted in an effort to allow the themes to reflect accurately the interview content collected for this study.

3.10.3 Interview Data Analysis

Interviews were carried out with 5 peer academic members who teach design thinking in their respective business schools in the United States. The academic interviewees volunteered to be interviewed, and all interviewees gave their consent to be interviewed. The duration of the interviews ranged between 50-80 minutes in length. Each interview was recorded and transcribed. Copies of the transcripts were offered to each interviewee for verification.

Also included are relevant extracts from 25 pilot interviews with students, which were used to shape the subsequent research focus for the academic interviews as a pilot after the first student survey. The pilot student interviews were used to further shape the later research, which included multiple surveys with students and academic members as well as the academic member interviews. The student interviewees volunteered to be interviewed, and all interviewees gave their consent to be interviewed. The duration of the interviews ranged between 40 minutes to 60 minutes in length. Each interview was recorded and transcribed. Copies of the transcripts were offered to each student interviewee for verification.

When considering what should be regarded as a theme, Braun and Clarke (2006) claimed that a theme is expressed by something, which is important within the data set, which relates specifically to the question, and is reflective of response patterning. However, not all themes will be critical to the researcher and the research topic. Within qualitative analysis, Braun and Clarke (2006: 16) further claimed ‘hard and fast’ answers to the amount of data needed to determine a theme does not exist. In

determining the themes for this study, the researcher looked to find fundamental links between the theme, the question, and the overarching research subject. Additionally, thematic analysis, according to Braun and Clarke (2006), is very flexible in that it allows for the judgment of the researchers in determining what actually constitutes a particular theme. However, it is critical that when determining themes, the research be consistent.

3.10.4 Coding the Interview Texts

Interviews were conducted, transcribed, and the data coded. Codes enable the researcher to identify an attribute of the data, which might be of importance to the researcher. According to Braun and Clarke (2006: 88), the attribute may be 'semantic content or latent.' Furthermore, according to Boyatzis (1998) codes refer to 'the most basic element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon' (cited in Braun and Clarke 2006: 88). Attride-Stirling (2001) and Lee and Fielding (1996) further supported this when they claimed that data reduction is a fundamental strategy for qualitative researchers to utilise. Also, coding is not unique or indispensable but simply one of many techniques in qualitative analysis (Attride-Stirling 2001).

In this study, the researcher reviewed the data and broke the text content into meaningful and manageable segments, allowing for a coding framework to be utilised. The coding framework is based on the surveys and repeated content in the interview text, such as specific words or phrases that were used in answering the research questions.

The research questions focus on the specific points below:

1. Design thinking within the core business school curriculum
2. The importance of design thinking in business school education
3. The importance of business students' use of design thinking to better understanding user needs
4. The importance of business students' use of design thinking to inform decision-making
5. How business students learn design thinking best
6. Difficulties for business students in learning design thinking
7. The role of empathy for business students
8. The ideal environment for business school students to learn design thinking
9. Elements of design thinking that business school students find valuable to learn
10. The overall value of design thinking to business school students

The focus was on specific topics, words, and issues that were repeated within the list above. The process of coding the data was done in repeated stages, using highlighters and notes to identify segments within each interviewee's research question response. The identified segments were then inserted into a table for further review. According to Attride-Stirling (2001: 391), 'this a commonly used procedure and parallels are easily found in the literature', such as in 'Bryman and Burgess 1994, Corbin and Strauss 1990, Miles and Huberman 1994, and Ritchie and Spencer 1994'.

The codes are based on the specific answers from the research interviewees and surveys and are guided explicitly with focus on the research questions.

3.10.5 Verification of Coding

All interviews and coding were reviewed and verified by a neutral peer academic member at Northwestern University's McCormick School of Engineering, whose research and teaching is centred on qualitative design research and design thinking in the engineering school. The review and coding verification was done independently and was not influenced by the researcher. Feedback from the verification was incorporated into the final coding process.

Initially, interview coding was done to measure the interview content frequency. This was conducted by using the software, QDA Miner, which takes qualitative input content and outputs quantitative measurable data. This data informed the next level of coding and thematic identification.

Interview Coding Participant Identification

- 'AM' stands for Academic Member (a total of 5 participated)
- 'S' stands for Student (a total of 25 participated)

Interview Question and Coding Example

An example of a research question and coded segments for a particular interviewee can be found in Table 16 below:

Table 16. Interview Question and Coding Example

Interview Question and Coding Example

CODE	QUESTION: What difficulties have your business students had in learning design thinking?
AM 1	For most business students, design thinking is radically different from most all classes they have taken in the business school.
AM 1	For business students, it is not always evident exactly how design thinking will be used in the classroom and later in the work place.
AM 1	Business students struggle to utilize design thinking outside of the studio bubble, where everyone has a shared level of experience, language and tools.
AM 1	Business students often come to design thinking with interest but skepticism.
AM 1	Design thinking must be directly connected to business and business outcomes in the classroom.
AM 2	For most business students, the empathy quadrant is difficult for them to understand and master.
AM 2	Understanding people and gaining empathy in context for many is as far away as possible from what they are comfortable doing.
AM 2	Business students often converge too fast because they move through insights too quickly without stepping back and being reflective and digging deeper.
AM 2	Business students struggle to see things because they have difficulty moving past their own assumptions.
AM 2	Business students often have an inability to let go of their own ideas and as such empathy, sharing ideas for feedback and pivoting are difficult.
AM 3	The cynical business student minority is very difficult to manage in the classroom.
AM 3	Design thinking content cannot simply be designed for the most enthusiastic student.
AM 3	Large blocks of studio time that are commonplace in a traditional design school setting — are not commonplace in business school. The majority of the business students' coursework is delivered in a lecture-style format — that doesn't allow for other format times (such as studio time) to exist in their schedule.
AM 3	The rhythm required in design exercises, tasks, and sessions feels different and less rigorous than what business students are familiar with, through the majority of the non-design business classes that they are taking.
AM 3	Most business students default to a divide and conquer type of approach to work which is the opposite of what is needed to learn design thinking.
AM 4	Most business students are inherently uncomfortable with ambiguity.
AM 4	Conducting ethnography, in which business students have to engage directly with people in deep conversations, is challenging.
AM 4	Teaching business students, who are often data driven, to be hypothesis driven is difficult to do if the students struggle with or refuse to understand and gain contextual empathy.
AM 5	Business students often default back to what they know and are comfortable with.
AM 5	Business students are often caught up in proving something to be right through quantitative data, rather than going through the discovery process.
AM 5	Invention and creativity is difficult for business students because it's out of their comfort zone and is different from all other management coursework they do.
AM 5	Creativity can be taught. However, many business students are not open-minded to learning it.
AM 5	Overall, it's the baggage that comes with business that is most difficult for business students to overcome when learning design thinking.

After the interview data were coded, specific themes were extracted from the coded segments. The most significant themes were extracted by going through the text of each segment within each question. This step allows the researcher to identify underlying patterns within the data set. The researcher then reviewed the selected themes and refined them further into a smaller set of non-repetitive themes that was more manageable, concise, and significant (Attride-Stirling 2001). Significant themes were developed, according to Boyatzis (1998), in the next step where interpretive analysis of the data set is done.

3.11 Summary Conclusions

This chapter presents the specific research aims supported by the methodology and methods of the research and its rationale. Additionally, the chapter defines the setting and research participants context and backgrounds. The specifics are as follows:

- The researcher conducted this study as a responsive action researcher, from a constructivist position.
- The study aimed at understanding; therefore, it is predominantly a qualitative approach.
- Methodologically, the study focused on understanding matters arising from the main research question.
- The course of development of research methods is best described as iterative and responsive to what was discovered as the study progressed.
- The research was conducted over a four-year period with multiple phases.
- Research was conducted with a mixed methods approach, relying on literature, online surveys, and qualitative semi-structured interviews.

- A total of six research aims are identified, which are rooted in understanding contextually - student backgrounds and experiences with learning design thinking, as well as peer academic members background and experience in teaching design thinking to business students.
- Northwestern University's Kellogg School of Management was the primary student research laboratory.
- Business students attending Northwestern University's Kellogg School of Management were the student participants for the research.
- Business students attending Northwestern University's Kellogg School of Management who have enrolled in and completed the prototype class, Research Design Build were the student research context.
- Business student participant data was gathered through repeated engagement with the same 180 business students. A total of four surveys and one interview was utilised.
- Academic members from top ten business schools in the USA and regarded business school peers, identified through snowball sampling, were the academic participants for the research.
- Academic member participant data were gathered through repeated engagement with the same five academic members over the period of one- year. A total of one survey and one interview was utilised.
- QDA Miner software, a qualitative data analysis tool, was utilised to determine the frequency of keywords identified. This data helped to inform future coding.
- Thematic analysis, informed through various research inputs was utilised to identify final themes for future contributions to knowledge.

CHAPTER 4

Research Results – What Was Found

Chapter 4: Research Results—What Was Found

4.1 Introduction to Research Results—What Was Found

This chapter identifies and analyses nine themes based on the primary research, which includes the findings from

- four surveys and
- twenty-five (25) qualitative in-depth interviews with students and
- one survey and five qualitative in-depth interviews carried out with peer academic members.

This research was conducted over a four-year period.

Each theme identified is supported with specific qualitative interview quotes that provide a contextual richness from both peer academic members and students. Additionally, specific analytic data from the surveys is used to support each theme.

Specifically, the chapter includes the following:

Thematic Analysis:

- Themes and analyses developed from the primary research and mapped to opportunities within the literature review

Surveys:

- Survey 1—Pre-RDB (Research-Design-Build)

To understand the students' background in analytics and creativity, quantitative and qualitative data, empathy, and design thinking before business school and prior to taking the design thinking class

- Survey 2—Post-RDB (Research-Design-Build)

  To understand the students' experience with a design thinking approach, the environment for learning, how we inform empathy and decisions through data, and the context for learning design thinking after having taken the first design thinking class

- Survey 3—Learning to Be a Design Thinker

  To understand what is important for students when learning to be a design thinker from peer academic members who teach design thinking at business school institutions other than the Kellogg School of Management at Northwestern University

- Survey 4—Elements of Design Thinking

  To understand the students' experience before and after Research-Design-Build (RDB), the difficulties in learning, and the value they place after their design thinking experience with the following specific design thinking elements: ethnographic research, empathy, identifying the right problem to solve, framing the right problem to solve, visualizing ideas, developing more than one solution, storyboarding, prototyping, iterating solutions, critique, creativity, and studio culture

- Survey 5—Design Thinking Differentiation and Competitive Advantage

  To understand the value the students place on design thinking as a differentiator and a competitive advantage after having taken the design thinking class, Research-Design-Build (RDB)

Student Interviews:

- To understand in greater depth the background of the students, their business school academic experience, their Research-Design-Build (RDB) experience and their overall experience with the teaching, learning, and language used in design thinking

Academic Member Interviews:

- To understand in greater depth how design thinking was utilised at their university, its importance in business school education, the understanding and impact of design thinking in decision-making of their students, success stories, struggles, and overall value of the topic

4.2 Themes Identified and Developed

Developing themes emerged from the academic member and student interviews and surveys, and these were reviewed against the literature review conclusions. A total of nine specific themes were finalised based on opportunity areas within the literature, interviews, and surveys. Extracts support the themes with origins identified below (see Table 17), while specific extract content is found within each thematic category, where

appropriate. The specific mapping of themes to opportunities areas within the literature can be found in Appendix S.

Table 17. Themes Developed and Extracts

Themes Developed and Extracts

	OPPORTUNITY	EXTRACTS			
THEMES	LITERATURE	ACADEMIC MEMBER INTERVIEWS	STUDENT INTERVIEWS	ACADEMIC MEMBER SURVEY	STUDENT SURVEYS
1. The importance of design thinking in modern business school education	✓	✓			✓
2. Design thinking and the business curriculum	✓	✓	✓		✓
3. Design thinking pedagogy	✓	✓		✓	✓
4. Critical elements of the design thinking process	✓	✓		✓	✓
5. Learning through contextual experience	✓	✓	✓	✓	✓
6. Studio culture	✓	✓	✓	✓	✓
7. The value of design thinking to business students	✓	✓	✓		✓
8. Difficulties business students have in learning design thinking	✓	✓			✓
9. The complexity of seeing value in design thinking for business students	✓	✓			✓

4.2.1 Theme 1: The Importance of Design Thinking in Modern Business School Education

Analysis of Interviews

Design thinking is not universally part of business school education. It is limited to only a few business schools in the United States, and, within those institutions, access and depth of learning vary. The five academic members interviewed all teach design

thinking content within business schools. They all reported that in order for business to remain competitive in a rapidly changing world, and to promote and develop innovation, a creative design thinking approach is fundamentally important. Several interviewees noted that one of the most critical skills in business leaders is the ability to drive innovation and to be creative. Innovation is seen as a function of both creativity and execution, and the importance of both together is stressed.

The competitive landscape of business requires deeper understanding of people, and yet, according to these academics, business schools do not address skills and perspectives around empathy. Design thinking is grounded in empathy and as such, can enable business students to better observe and notice contextual behaviours and needs that can better inform critical thinking.

Some interviewees suggested that design thinking acknowledges uncertainty and provides a framework of discovery and synthesis that can be critical to solving complex and ill-defined problems in the marketplace. Today, business students are generally not well equipped to address such issues. Others built upon this same idea by describing how design thinking is a way to connect elements of business and can move people and organisations to address real problems that matter.

Below are contextually rich extracts from five academic members (AM) interviewed, which serve to further illustrate the theme of the importance of design thinking in modern business school education:

AM 1:

‘Design thinking helps to create and drive innovation in a market where things are very, very competitive and things are changing very rapidly.

‘I think innovative thinking, innovative culture, driving innovation, and transforming innovation in a large-scale organization are all things that I think are core. You could go to a business school and you could learn about strategy, you could learn about finance and those types of things, but one of the most critical skills businesses are looking for right now is the ability to drive innovation and be creative. I think of innovation as being a function of both creativity and execution. And in order to have innovation, you have to have both. You have to be able to have the great ideas, but you also need to take it out of the market and be able to be successful. So it’s all about creativity and execution. Students go to school in our education system and learn how to execute something…solving a problem in the most efficient way.’

‘If you’re looking for innovation, you also need that creativity side of the equation; it’s not just execution. It’s also not just about problem-solving…but finding the right problem to solve in the first place. It’s about problem finding, and that’s one of the major value propositions of what design thinking is all about. And I think that’s something that design thinking clearly gives in terms of its methodology and output. I think that’s why it’s a great way to help organizations even out that innovation equation between creativity and execution. It’s design thinking that helps bring organizations into balance between the two.’

AM 2:

> ‘In design thinking, we kind of translate that into customer empathy, but if you look at the organizational literature, equally important is to have empathy for employees or others…so there’s emotional empathy, there’s cognitive empathy. So there’s observe-and-notice, which is critical whether you want to say that’s only a design thinking thing….it could be that I’m looking at lots of big data in observe-and-notice and I’m trying to find patterns in that data. That’s also important—that I’m asking good questions. So the frame and reframe…how do I take all that messy data…there’s critical thinking tools there as well. What’s an inference? What’s assumption?’

> ‘Imagine and Design—and that’s on the why side. That’s probably the most critical stuff that I think twenty-first-century business students need. The skills we teach on the ‘how’ side, they still need them. Diverge, converge, come up with multiple different solutions. Don’t just converge on the first one, that’s important. I think that’s a standardized testing problem that we just trained a lot of students to come to the one and only answer. Fifty percent of business students then test out in the upper right-hand quadrant as converging learners and so design thinking skills and a design thinking mindset would be critically important in terms of business students becoming more innovative.’

AM 3:

> ‘Design thinking is important to modern business education when we think of design thinking as kind of a set of principles, and especially a kind of an approach to problem-solving that is more about synthesis based on understanding and observation of human needs, and then a process of discovery driven by integration and experimentation that acknowledges how much uncertainty there is in that process of discovery. As such, design thinking requires different types of methods than just raw analysis and synthesizing of

those insights and discoveries into solutions that seek to solve a particular set of problems.'

'Design thinking is a kind of set of principles and methods to help with this kind of more discovery-driven type of problem-solving, and I absolutely believe that's a critical thing to teach MBA students for a number of reasons, starting with, it's one of their weaknesses. MBA students tend to have backgrounds that have given them really good tools for analysis and for kind of data-driven decision-making and for sort of figuring things out through just thinking really hard about things. And some of the problems that we're increasingly facing don't fit well into that paradigm.'

AM 4:

'I'm not sure that I would want to go toe-to-toe with anyone that said it was any more important than a class in accounting or a class in finance or in marketing or whatever, but I do think it brings a different set of tools to the business school that are extremely helpful in today's complex business environment.'

AM 5:

'Fundamental to modern business education, yes. However, not all business students embrace design thinking and, more importantly, invention, discovery, and creation.'

'Design thinking is a way to connect elements of business, such as strategy and marketing. It's also a way to connect teams and people to real problems that matter.'

Analysis of Surveys

Students surveyed lacked both creative and design thinking backgrounds, and they relied significantly on analytical approaches to solve problems, while valuing quantitative data over qualitative data prior to coming to business school. They were also uncomfortable with empathy and rarely used it to inform decisions regarding users/customers.

Below are contextually rich survey extracts, which serve to further illustrate the theme of design thinking and the business curriculum:

Survey 1—Pre-RDB (Research-Design-Build):

> 68% of students strongly disagreed that prior to coming to business school their business skill set was creative, while 74% said they strongly disagreed that they are confident using creative approaches to solve problems.

> 83% of students strongly disagreed that prior to coming to business school they used a design thinking approach to solve problems in their work practice, while 94% strongly disagreed that they are confident using a design thinking approach to solve problems.

> 69% of students disagreed that prior to coming to business school, empathy informed their decisions regarding users/customers in my work practice, while 87% said they disagreed that they are comfortable using empathy.

Discussion of Analyses

Most business schools do not have a robust design thinking component within their portfolio. However, business schools are tasked with educating future business leaders for a world that is growing more and more interconnected, complex, and competitive. While a design thinking approach, which is heavily informed by empathy, is unfamiliar to many business students, it actually complements a business approach in the service of problem-solving. They both utilise different ways of thinking and tools, which together, enable business people to understand people and problems more deeply and to scale and implement solutions that are meaningfully desirable, feasible and viable to the business. The combination of these approaches enables future business leaders to think, act, and innovate in a more holistic way.

4.2.2 Theme 2: Design Thinking and the Business Curriculum

Analysis of Interviews

Within most business school curriculums, design thinking content does not readily exist. However, with the introduction of design thinking, business students gain skills and perspectives that better enable them to understand people through empathy and to think more deeply about problems through a human-centred lens.

Collectively the academic interviewees claimed that business students, who often bring to their courses actual working experience, believe that they already know what people want and often do not make an effort to understand people in a deeper way. For example, one interviewee felt it important to create a moment of discomfort for the students so that they realise that they do not have all the answers and that a different approach and different tools may help them. Additional comments suggested that most

business schools do not teach human-centred design in the required curriculum anywhere and that a toolkit for diagnosing user needs is not a prominent feature of a business school curriculum. Furthermore, business curriculums fail to empower and enable the idea of deep thinking and deep understanding of people. The interviewees also agreed that design thinking can bring business students to a deeper understanding of people and the problems that matter most to them.

Many interviewees claimed that students who have learned design thinking skills are positively differentiated from those students who have not. These skills were seen as a competitive advantage for them as innovators. For many, the qualitative approach to design thinking was complementary to the analytic side of most business classes. Further comments suggested that because design thinking students understand people in the context of their lives in a way that is not necessarily taught in traditional business schools, design thinking should be part of the core curriculum in all business schools that seek to be known for innovation.

However, the students felt that design thinking skills were not good enough as a stand-alone skill and that they needed to be coupled with actual business context in order for them to resonate. For example, several student interviewees indicated that design is arrogant, in that it cannot solve all problems. There was a sense amongst student interviewees that design thinking needs to be actionable from a business perspective in order for them to value the content within the business curriculum. As such, design thinking skills in combination with business skills provides students with a new

‘perspective and toolkit’ that is important to problem-solving in the service of innovation.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of design thinking and the business curriculum:

AM 1:

> ‘Ultimately, it’s about finding the right problem, and what design thinking is very good at is, in the approach of finding the right problem to solve, it puts really the emphasis ultimately on the end user or customer experience. The user is at the heart of everything…that’s why they call design thinking a human-centered methodology.’

AM 2:

> ‘At its core, design thinking brings you closer to users. It helps to shape a way of seeing that is empathy driven.’

> ‘The challenge is putting business students in the context in which the decisions they make can have a tremendous impact…designing in context will enable them to see things differently and hopefully better inform them. This goes well beyond the classroom setting.’

AM 3:

> ‘They [people] hear that you need to be user-centered or that you need to be human-centered and really focus on human needs, and they’re like, “Yeah, of course, I do that,” and they don’t realize the extent to which they don’t.’

> ‘When I talk about being human-centered, what I mean is this: whose problems are we trying to address? Whose lives are we trying to improve? And never forgetting that it’s not about me making money but it’s about sort of as a reason, but if I do end up making money it would be as a consequence of really improving somebody else’s life in a substantial way. And if we start from a deep understanding of those needs, those realities, we’re much more likely to develop a solution that truly works for them and not something that sounds great to us but that doesn’t necessarily solve the problems that we say we’re going to solve.’

AM 4:

> ‘Design thinking brings a whole new set of tools to business students around user needs that they haven’t been exposed to before. I can’t think of anything much more fundamental to design thinking than developing a deeper set of insight into the needs of whoever you’re designing for.’

AM 5:

> ‘I often find that business students are simply in a rush to check the development boxes along the way without really giving the proper time needed to go deeper in the understanding of people. You can never truly gain empathy without digging deeper…this is critical.’

> ‘It is this idea of deep thinking or deep understanding that is fundamentally lacking in business schools.’

> ‘Empathy is critical to design thinking, but you need to go deeper and you need to go beyond the obvious. So again, yes…using design thinking as part of the business school curriculum can help inform the decision-making of students if it’s practiced in a way that is deeper than simply a surface application.’

Below are contextually rich extracts from six students interviewed, which serve to further illustrate the theme of design thinking and the business curriculum:

S1:

> ‘Design thinks it can solve everything. But after taking Research-Design-Build and studying design thinking, I can see a role for it in business….it must be coupled with business thinking.’

> ‘Design is not good enough as a stand-alone offering.’

> ‘I liked that we learned design thinking through the context of a real problem with a real business. MBAs need that context, and it helped me and my classmates understand it in a way that resonated with us. We didn’t study design thinking in isolation from the real world and real constraints of business.’

S 5:

‘For me, my design thinking skills differentiate me from others in business school, and I think it sets me up to be a better innovator.’

‘[N]ot sure why we need to call it out as a unique skill set…having studied and applied it in class, I think design thinking should be part of the general core curriculum. The user-centered approach should be another set of tools that business leaders have to choose from.’

S 8:

‘Not everyone in business school has the capacity to be a design thinker. But I do think that as innovation becomes more and more difficult to achieve, a design thinking toolkit could be very valuable. That could be easily one of several toolkits that you use in business depending on the stage of the challenge or the nature of the problem you are trying to solve.’

‘The ability to understand people in the context of their lives was a huge learning [experience] for me through design thinking, and I think that, in and of itself, is incredibly valuable to business school education.’

S14:

‘The qualitative nature of design thinking is a great complement to the analytical side of most business education.’

S 19:

> ‘I want to be an innovator in tech. Design thinking skills in combination with business skills set me up to better understand people and problems, frame opportunities, and create something new at scale. I think you need both perspectives to be successful.’

> ‘Design alone is not as valuable to me. But in combination with my business skills, I bring an entirely different perspective and toolkit to problem-solving. I think that is a really powerful combination.’

S 25:

> ‘[D]esign-thinking skills are not really taught in the business schools and most business students don’t have them coming in…they should be. Having taken Research-Design-Build, I can now say with confidence that more MBAs would benefit from design thinking as part of the wider curriculum…maybe core.’

> ‘I’m always in high demand for case competitions because my design thinking skills are helpful in so many phases of innovation. I have been on three different winning teams for case competitions.’

Analysis of Surveys

Students surveyed recognised that a design thinking approach to solving problems is different from a business approach and that the business curriculum enables less exploration, collaboration, creativity, visualisation, experimentation, and human-centred, hands-on approaches to learning. They also identified that a combination of quantitative and qualitative data was valuable based on their actual classroom

experiences. Furthermore, elements of design thinking, which students came to business school not knowing, proved to be of value to them after having participated in a specific design thinking curriculum.

Below are contextually rich survey extracts, which serve to further illustrate the theme of design thinking and the business curriculum:

Survey 2—Post-RDB (Research-Design-Build):

> 97% of students strongly agreed that a design thinking approach to problems is different than a business approach to problems, based on their classroom experiences.

> Students strongly agreed that a design thinking approach to problems is more exploratory, collaborative, creative, visual, experimental, human-centered, and hands-on than a business approach to problems based on their classroom experiences.

> 79% of students agreed that a combination of both quantitative and qualitative data proved to be the most valuable resource when shaping their decisions on how to address the project challenge in class.

Survey 4—Elements of Design Thinking:

> Students either entirely or mostly agreed that elements of design thinking learned, including ethnographic research, empathy, problem finding and

> framing, visualization, solutioning, storyboarding, prototyping, iteration, critique, and creativity, were valuable to them as business students.

Discussion of Analyses

Business students seek to gain directly applicable knowledge in business schools that they can actually use as future business leaders. They have little interest in coursework that they deem as peripheral. As such, learning a design thinking approach as a stand-alone is not good enough for business students. It simply cannot be seen and practised in a way that is perceived as undervaluing the subject and positions it as a creative novelty. The way business students learn design thinking needs to be through an integrated framework that is focused on problem-solving, utilizing both a creative design thinking approach and an analytic-business approach. Design thinking content needs to be tied directly to business challenges, which enables business students to understand, practise, and learn the value of design thinking through a business context. This positions design thinking to be absorbed and not learned in isolation, enabling both the students and the business school to see the value and realise its importance in the broader service of problem-solving.

4.2.3 Theme 3: Design Thinking Pedagogy

Analysis of Interviews

While design thinking can be powerful, it is also unfamiliar to most business students and as such, would need to be taught in a way that elevates the subject beyond an intellectual conversation. Business students are taught business content in a way that is very different from the way design or, in this case, design thinking should be taught.

Business content is often taught through the case study method and is delivered through structured lectures. This is the format in which most business students receive and process learning. However, design thinking needs to be taught, absorbed, and learned very differently.

Academic interviewees acknowledged that design thinking is very different to what business students are naturally comfortable with. As such, the learning needs to be driven by a radically different teaching approach than is commonplace in the business school. Most interviewees felt that in order for business students to truly learn design thinking, they need to understand that design thinking is not simply an intellectual exercise, and that learning-by-doing was critical. It is additionally stated that learning comes through practice and active discussion of what was discovered in the field.

On the whole, the academic interviewees all agreed that design thinking is learned best from a lived experience and that learning comes through actually doing something through real-life applications. For example, one interviewee argued that learning comes from putting students through a project-based experience that makes them uncomfortable. It is in that moment of being uncomfortable that the students realise they do not have all the answers and become receptive to other approaches. All academic members interviewed agreed that project-based application and practice was important for business students in learning the core concepts and methods associated with design thinking.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of design thinking pedagogy:

AM 1:

> ‘[B]usiness students have an expectation of what the learning experience should be at business school.’

> ‘Design thinking is very different from finance, accounting, operations, and strategy. It needs to look, feel, and act different than other business school classes to command attention. Design thinking is not better than, but it is different, and it requires a different way to teach, experience, and learn it. I go back to the studio model and project-based experiences as being fundamental.’

AM 2:

> ‘To learn design thinking, you need to truly experience it. You need to feel it firsthand.’

> ‘It’s difficult on many levels…but in small teams that have student leaders that help bring others along.’

> ‘While success seems to vary, it definitely requires high touch, and so small teams and lots of hands-on engagement is critical.’

> ‘The business school and the design school look and feel different. But in order for business students to truly learn design thinking, they need to be put in a

design-school model of learning. This is radically different from traditional business school methods.'

AM 3:

'The rigor of design thinking is in the repeated practice of the concepts and application to projects. Cases and readings could provide a perspective, but it is not the best way to experience and learn design thinking.'

'Number one, you need to put students through some sort of struggle so that they realize that they actually don't have the answer. First, give them something to work on that on the face of it would seem like they are very good at it. And having them jump into that problem or task following their instincts, and then realizing that they are not succeeding and that it's actually going wrong. Once they struggle through that and they're kind of puzzled about it, I think that's what creates the openness for them to be willing to accept something different.'

'Once that happens…you then allow them to practice again so that they can get a moment of insight. Moments of insight from my perspective happen when you're struggling with something and you try something different and it works.'

'The only way they can experience it is through experience, through actually doing something, actually struggling through something and then trying a different set of tools that allow them to arrive at a solution that they now know they wouldn't have otherwise been able to achieve.'

AM 4:

> ‘Most of the learning at the business school comes through the case study method, and I use a little bit of case method in the design thinking class to introduce them to the different tools and aspects of the process, but most of the learning happens when they actually have to go out and apply it in a real-life project.’

AM 5:

> ‘Again, it goes back to the notion of going deeper. Thinking deeper and understanding at a deeper level. This cannot be simulated and needs to be practiced and nurtured through project-based application.’

> ‘The moment of deep understanding can only be discovered in the context of actually going out in the field and learning about people in a more meaningful way. The fieldwork is then brought back into a studio setting for further reflection and development work.’

> ‘Shallow learning comes with a lack of deep practice.’

Analysis of Surveys

The academic members surveyed identified that traditional business school approaches to learning through cases, lectures, and readings were not ideal for learning to be a design thinker and that a project-based experience with business context would be better. Additionally, a structured process would be used. Students surveyed also

identified that a design thinking approach gives them an additional set of tools, allowing them to better address needs.

Below are contextually rich survey extracts, which serve to further illustrate the theme of design thinking pedagogy:

Survey 3—Learning to Be a Design Thinker:

> 80% of academic members entirely disagreed that case studies are best for learning to be a design thinker.
>
> 60% of academic members mostly disagreed that lectures and readings are best for learning to be a design thinker.
>
> All academic members entirely agreed that a project-based experience was best for learning to be a design thinker, while 80% mostly agreed that integrating real business constraints and considerations is best for learning to be a design thinker.
>
> 80% of academic members mostly agree that utilizing a systematic and repeatable process is best for learning to be a design thinker. 79% of students also agree, according to Survey 2.

Survey 5—Design Thinking Differentiation and Competitive Advantage:

> 88% of students entirely agreed that a design thinking approach gave them another set of tools to identify and solve problems for users/customers, based on their classroom experiences.

Discussion of Analyses

Authenticity is the key to teaching and enabling business students to see the value in design thinking. The content cannot be delivered in a way that is not approachable and interactive. Traditional business school methods, such as case-based learning, will not provide business students with the ability to experience empathy first-hand or the collaborative creativity that is fundamental to design thinking. As such, design thinking must be taught to business students through a deep, hands-on learning immersion that is familiar with design students.

This immersion will not only enable business students to learn through doing, it will also enable them to experience first-hand the value of the approach. Through this authentic learning experience, business students will gain confidence in the subject in a way that cases and readings can only simulate or illustrate.

4.2.4 Theme 4: Critical Elements of the Design Thinking Process

Analysis of Interviews

Within design thinking, there are a number of important elements of the process to learn. However, it’s important to know that business students with design thinking knowledge will not be designers in the traditional sense of the word. They will, however, have the ability to understand people more deeply through fieldwork, to frame

the right problem to innovate through synthesis of user insights, and to collaborate better through an open culture and mindset of building and critique.

The academic interviewees felt it was important first and foremost for business students to use design thinking to find the correct problem to solve above all else. For example, one interviewee indicated that getting to the right problem to solve was more important than the act of brainstorming and other creative elements generally associated with design thinking. The idea of problem-finding and problem-solving as core elements to learning was present in all the interviewees' feedback. Other commentary was supportive of the idea of actually going into the field to gain empathy first-hand, arguing that the repeated act of doing built confidence in the student.

Further comments suggested that while we teach business students elements of design, it is important and valuable to the student to understand that they themselves are not designers in the traditional sense. Instead, by learning the human-centred design methodologies within design thinking practice, they gain empathy and adopt humility in their approach to business.

Additionally, critique was supported amongst the interviewees. Commentary suggests that a culture of critique, which is central to design and unfamiliar in business schools, is important for business students to learn and embrace because direct feedback is another path to learning.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of the critical elements of the design thinking process:

AM 1:

> ‘Finding the right problem to solve is the first step…through a human-centered process, notion, and point of view.’

> ‘[S]tart with just framing the value of design thinking and how it differentiates from other processes that are out there in the industry. For me, especially for business school students, just framing it as the difference between problem finding and problem-solving is really the first big ‘aha’ moment. This is fundamentally an innovation process that helps you create a methodological way of finding the right problems to solve…that's usually something that you don't learn elsewhere.’

AM 2:

> ‘[O]nce you go out and talk to one or two people, you get over your fear doing that, you get over your fear of not having the right answer before you go talk to people, etcetera. So the ones who are willing to do that. I think that has been valuable.’

> ‘[A]nother thing that I think has been valuable for some number of them is diverge-converge. The way I teach it, I call it, the ‘dynamic balance,’ diverge: generate options, converge: select options. Can’t do both at the same time. So be clear about when you’re diverging and when you’re converging.’

AM 3:

‘[O]ne of the things that we have to be mindful of and that are kind of tricky is that we are teaching methods and things that we’ve brought in from design but we can never expect—we should never expect and shouldn’t even create that expectation in our students—that they can or that they should become designers.

‘[T]eaching the importance of empathy and human-centered approaches connects them to the core concept of humility. And so, those core initial things about understanding how much uncertainty there is and how humble you need to be and, therefore, how human-centered and experimental you have to actually be, are fundamentally valuable to business students.’

AM 4:

‘[T]hey need help scoping problems because they tend to define problems too obviously and too narrowly. They need help being taught how to go out and do ethnographic interviews and use tools like jobs to be done and journey mapping.’

‘[T]hey need a lot of help figuring out how to take raw data and convert it into insights, and then they need more help about how to convert those insights into ideas and how to come up with ideas.’

‘People are used to doing it once and thinking they’ve gotten the right answer, and the quality of ideas is a function of the depth of the insights. So the first set of insights is usually pretty superficial, which means your ideas are going to be pretty obvious. So the more students push deeper into their insights, the better

the quality of the ideas they will produce, but they need to have the discipline to keep going back and revisiting and trying to push themselves to a deeper place.'

AM 5:

'I could argue that all the elements of design thinking are important to learn, from field research to making to iterating.'

'[T]he ability to find a problem that is important and means something to people and the ability to generate a hypothesis from which you generate lots of ideas.'

'Business students often get hung up on the first solution—and they spend all their time polishing one idea. It goes back to digging deeper and truly understanding people.'

'The notion of critique is incredibly valuable. Putting ideas up on a wall and getting direct feedback is an important part of design thinking…but business students often shy away from critique…they don't like to be wrong. But critique is central to design and we can all learn through critique.'

Analysis of Surveys

Academic members surveyed identified a number of hands-on tactics throughout the design thinking process, which support the best way to learn to become a design thinker. Furthermore, open-mindedness was universally identified as important.

Students lacked an understanding of a variety of elements associated with design thinking prior to exposure and learning through the class, Research-Design-Build (RDB); however, students mostly agreed that they understood these elements after exposure and learning in the class.

Below are contextually rich survey extracts, which serve to further illustrate the theme of the critical elements of the design thinking process:

Survey 3—Learning to Be a Design Thinker:

> Academic members entirely or mostly agree that the following were best for learning to be a design thinker; these include field research, empathy, problem finding and framing, visualization, solutioning, storyboarding, prototyping, iteration, critique, and creativity.

> All academic members surveyed entirely agree that open-mindedness is best for learning to be a design thinker.

Survey 4—Elements of Design Thinking:

> Students entirely disagree that they understood ethnographic research before taking Research-Design-Build.

> Students somewhat to mostly disagree that they understood, prior to Research-Design-Build, how to identify the right problem to solve, how to frame the right

problem, empathy, how to visualize ideas, how to storyboard, how to prototype, how to be creative, and studio culture.

Students mostly agree that they understood, post Research-Design-Build, how to identify the right problem to solve, how to frame the right problem, empathy, how to visualize ideas, how to develop more than one solution, how to storyboard, how to prototype, how to iterate solutions, how to critique, how to be creative, and studio culture.

Discussion of Analyses

We cannot expect business students to become designers in the traditional sense of design, such as industrial design or graphic design, which is heavily influenced by aesthetics and human-factor usability considerations. However, in order for business students to become design thinkers, they need to become problem-solvers utilizing design tactics that do not require aesthetics or form-giving as part of the process. They will become business designers, utilizing tactical design skills that traditional business students do not learn.

Business students will learn how to understand people more deeply through deep fieldwork that enables them to gain empathy in a way that quantitative analytic data simply will not. They will learn and use this perspective to identify and frame problems more meaningfully, ultimately being able to better target the right problem to solve. They will learn and use visualisation and storyboarding skills to create and bring

ideas—not aesthetics—to life, inviting collaborative conversation and robust critique. They will learn and utilise prototyping skills to help build out ideas and learn how to iterate those ideas based on feedback.

Most importantly, they will initially struggle but will ultimately grow as design thinkers through the use of skills that were once unfamiliar but now can be used repeatedly. They will have confidence in their abilities because they themselves actually used and applied these skills in ways that enabled them to understand the value first-hand. The rigour of design thinking learning comes through the immersive depth and repetition of the journey.

4.2.5 Theme 5: Learning through Contextual Experience

Analysis of Interviews

To clarify, learning through contextual experiences in this context relates to business students applying design thinking to project-based challenges. This introduces real-world context and constraints, enabling students to gain stakeholder empathy and a deeper understanding of the challenges outside of the classroom. The students practise the concepts taught in the classroom and apply them to real-world challenges that enable them to learn through a lived experience. For example, commentary suggests it is important for business students to understand that design thinking is not just an intellectual exercise, further stating that this is a radically different approach to what business students are used to. Typically, business students would sit and listen to formal lectures in lecture-style theatres and do a lot of note-taking. In contrast, learning-by-doing was felt to aid open discussions in the context of a lived experience.

Most academic interviewees referred to a teaching style of ‘making it real’. Of these, some felt that putting students through a struggle would make them realise that they actually do not have the answer. Others stated that the struggle was key, as it led students to try different approaches until they found an appropriate solution. Students need to understand that in order to solve problems for people, they need to go out and understand people in a deep way. That can only be done through contextual practice.

This was reflected with the student interviewees who said that reading about design thinking was one thing, but actually learning design thinking through a project with business context gave them a perspective about how to use the skills directly that was missing through readings. Additionally, most student interviewees stated that connecting design thinking and business thinking together on a real project illustrated the seriousness of the subject of design thinking and how it is actionable.

Further comments suggested that many business students are interested in design thinking, but are unsure about learning through an action-oriented, in-context approach. For example, some student interviewees noted that going into the field to learn is very unusual for business schools, and that the approach made them uncomfortable, nervous, and lack confidence. However, learning the process through a hands-on approach made it very engaging. Students became more comfortable and confident with action-oriented, in-context learning the more often they participated in the process.

Additionally, it is stated that most of the aspects of a project-based, design thinking approach are ‘different’ from how business students are taught within the business

school. However, it is further stated that business students actually developed and innovated meaningful things as part of their project, which is unlikely to have happened without the understanding and use of design thinking.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of learning through contextual experience:

AM 1:

> ‘I think, especially for business students, it’s really learned by doing. Most importantly, they need to understand that design thinking is not just an intellectual exercise. It’s not learning through business cases…it’s actually learning through practice and I think it’s such a radically different approach, especially for people that are only familiar with the traditional way business courses are taught.’

> ‘Putting business students into real-world situations, actually even outside of the classroom, is very important in my opinion. Learning can actually be done outside the classroom and in the environment in which they need to practice design thinking.’

> ‘Further learning comes from open discussions and the consequences of what actually happened or the discussion of the consequences of what might happen if we did something differently. Design thinking learning comes from the lived experience.’

AM 2:

> ‘You need to make it real for students to truly understand the value. Making it real is very different from the traditional ways they learn in business school.’

AM 3:

> ‘If there was a short answer, it’s practice. Number one, I need to put my students through some sort of struggle so that they realize that they actually don’t have the answer.’

> ‘Moments of insight from my perspective happen when you’re struggling with something and you try something different and it works. And the only way they can experience it is through experience, through actually doing something, actually struggling through something, and then trying a different set of tools that allow them to arrive at a solution that they now know they wouldn’t have otherwise been able to achieve.’

AM 4:

> ‘I think they learn it best when they have to apply it in the real world…most of the learning happens when they actually have to go out and apply it in a real-life project.’

AM 5:

> ‘Learning design thinking occurs best through the project-based application of the process, skills, and deep thinking that is needed to solve complex problems. Business students need to understand that in order to solve problems for people, they need to go out and understand people in a deep way. That can only be done through contextual practice.’

Below are contextually rich extracts from six students interviewed, which serve to further illustrate the theme of learning through contextual experience:

S 2:

> ‘Learning design thinking through a business context, with a real project and with a real company, made a lot of sense. I could see how I could use the skills directly.’

S 6:

> ‘Using design thinking and business thinking together on a project felt natural once we got going…had no idea how I would apply design thinking prior.’

S 14:

> ‘I didn’t fully understand what it was all about until I actually had to do it in class. Reading about design thinking gives you a basic understanding of what it is. But to actually learn it, you have to really do it.’

> ‘Design thinking is a bit uncomfortable to do, but you get more comfortable the more times you do it. It’s the application of the tools and practicing it on a real challenge where I learned the most.’

S 17:

> ‘Applying design thinking through a real project was super impactful. I think a lot of students in the business school don’t take design thinking seriously because they think of it as a way to come up with crazy ideas only. They think design is not rigorous.’

‘[U]sing the project as the thread of the class, applying design thinking skills towards understanding people and creating innovation that was important to them and our challenge partner, it really came to life. Having to not only understand what was desirable but also feasible and viable for the business made it so [much] more relatable. I think connecting design thinking with the business considerations of the challenge partner is a critical way to learn the entire process while also showing the seriousness of the subject and how it can be actionable.’

S 24:

‘Design thinking seemed kind of mysterious at first. Going through the process in a hands-on way made it really engaging. I felt like we learned design thinking by actually rolling up our sleeves and doing it. No cases, no readings, just learning by doing.’

‘Actually, doing field research with people, creating frameworks, brainstorming and drawing concepts, building prototypes was all super powerful. Most of us had never done anything like this before, and doing it is so different than reading about it.’

S 25:

‘[T]he field research was very uncomfortable and I would have never done anything like this if it was not part of the class…the insights I learned in-field set up everything we did on the project, and I have no doubt that what we developed would have never had happened if it wasn’t for that work.’

Analysis of Surveys

Students surveyed recognised that the learning environment for design thinking often comes through fieldwork outside of the classroom. Additionally, learning design thinking through a project-based experience that had actual business context was effective for them based on their classroom experiences. Academic members further supported that project-based experiences are best for learning to be a design thinker.

Below are contextually rich survey extracts, which serve to further illustrate the theme of learning through contextual experience:

Survey 2—Post-RDB (Research-Design-Build):

> 78% of students strongly agree that the environment for learning design thinking is often outside the structured classroom, while 81% agree that the environment for learning business skills is often inside the structured classroom, based on their classroom experiences.
>
> 91% of students strongly agree that learning design thinking through a project-based experience was effective in Research-Design-Build.
>
> 93% of students strongly agree that learning design thinking through a real business challenge was effective in Research-Design-Build.

Survey 3—Learning to Be a Design Thinker:

> All academic members entirely agree that project–based experiences are best for learning design thinking, while 80% mostly agree that integrating real business constraints and considerations are best.

Discussion of Analyses

While actual project-based learning is not new, it is not necessarily utilised in the core coursework in many business schools. However, enabling business students to learn a creative subject such as design thinking through a business framework, which is very different from their backgrounds and other business school coursework, gives the subject a contextual importance and implied rigour that business students might not have otherwise recognised.

While the students are learning ‘by doing’, applying a design thinking approach to problem-solving, they must be driving the finding, framing, and creation of ideas towards the goal of successful business outcomes. They are, in a sense, learning design thinking while at some point parallel-pathing a business approach to the problem.

Ultimately, the students must deliver an originally innovative outcome that is informed through empathy, is ideated and tested with the user in mind, and is further shaped and scaled with the business in mind. All of which should be done within the framework and constraints of a business model that meets or exceeds desirability, feasibility, and viability.

This contextual learning experience enables business students to learn design thinking while also considering and solving—not only for the user but also for the business. This learning model brings the subject to life and positions design thinking for business students as a front-end approach to informing and shaping business outcomes.

4.2.6 Theme 6: Studio Culture

Analysis of Interviews

Within design pedagogy, working in the studio is crucial to successful teaching and learning. The studio culture is central to design education but not central to business education. In order for business students to understand and learn design thinking, they need to be situated in a studio environment that inspires open collaboration, teaming, and critique. Thus, the setting is critical to the culture of creative problem-solving, critique, and teaming. Putting business students in a studio setting, which is different from traditional business school environments, may lead to better outcomes.

For example, comments suggested that design thinking is a different approach to problem-solving from what business students are used to, and, therefore, it needs a different kind of environment to practise it in. Furthermore, space informs culture, and design thinking is very dependent on an open and collaborative culture.

Additional comments suggested that there is a certain feeling embodied by design thinking and that environment plays an important role in that feeling. As such, the academic interviewees felt strongly that in order for business students to better learn design thinking, they need to practise it in the context of a studio setting, which fosters openness and collaboration. For example, one interviewee reported that design thinking

does not take a lot of ‘fancy stuff’—it is just stuff that many business schools do not have, namely studio space. A studio space and the associated culture enable students to learn from each other and to feel a little less intimidated.

For student interviewees, studio culture felt odd for an MBA, but they soon realised how important and engaging the visual format could be for learning and sharing ideas. For example, one student noted that the feedback loops and critiques facilitated as part of the studio culture are popular and that students learn through the openness of the studio. The studio context, while different from the traditional business classroom setting, provides a format that gets everyone talking and collaborating. Additionally, it is stated that making work visible and sharing is very inspiring.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of studio culture:

AM 1:

> ‘The space you learn in can inform the culture, and the traditional business classroom is less than ideal for learning and practicing design thinking. Ideally, you want a more open environment that allows for creative problem-solving, teaming, and better collaboration. Often, design is taught in such open studio-like spaces, and I think that application would be no different for business students…business schools are typically set up for lecture-based learning.’

> ‘There is a certain feeling needed with respect to design thinking…space can play an important role in that feeling.’

‘The classroom is great for practicing what to do before you get out there in the field… and then also being able to kind of bring all the insights together and reflect together in the classroom. An environment for reflection and collaboration is key.’

AM 2:

‘Design thinking is a different approach to problem-solving than what business students are used to, and it needs a different kind of environment to practice it in. Often the materials used in the process require space.’

‘Space also informs culture. Design thinking is very dependent on an open and collaboration culture.’

‘In design thinking, outputs come in all kinds of different forms, from post-its to prototypes to visual maps.’

AM 3:

‘The physical setting of the traditional classroom is the physical setting of a typical MBA classroom, which is an amphitheatre type of thing. And I teach many of my sessions there.’

‘Many of the types of things that I’m describing in design thinking require more of a kind of flat open space with small tables that people can sit and work together around with the ability to easily share what they’re doing with everybody else. Designers typically work in such spaces.’

AM 4:

> ‘Physically, I don’t think design thinking takes a lot of fancy stuff; it’s just stuff that many business schools don’t have, namely studio-like space.’

AM 5:

> ‘Studio context. That’s it, plain and simple. Design thinking needs a space that is not perfect or polished. You need to have a space that’s messy and that allows for work to be done and ideas to be shared.’

> ‘It’s important that the studio is a place where the faculty can coach and mentor students in an environment that allows for both conversation and critique. Feedback is important and the studio setting seems to allow it in a way that a regular classroom cannot….it somehow feels less threatening and more collaborative.’

> ‘A studio space and culture enables them to learn from each other and feel a little less intimidated because often they are at the same level of design understanding…which generally is not very deep.’

Below are contextually rich extracts from two students interviewed, which serve to further illustrate the theme of studio culture:

S 5:

> ‘The idea of a design studio felt odd for an MBA at first, and as an engineer, I was a bit uncomfortable with the format. Once the class got going, I soon realized how engaging and visual the format could be, and I loved the share-outs in the gallery walk…the feedback loops and critiques were very popular, and I think everyone in class learned a lot through that openness of the studio.’

S 11:

> ‘Once the work was up and we could see the content, it was very inspiring.’

> ‘[M]aking it visual got everyone talking and collaborating.’

Analysis of Surveys

Academic members and students surveyed identified a studio-based experience as being important in order to best learn design thinking. Specifically, hands-on activities, collaboration, and critique were recognised.

Below are contextually rich survey extracts, which serve to further illustrate the theme of studio culture:

Survey 3—Learning to Be a Design Thinker:

> 80% of academic members entirely agree that a studio-based experience is best for learning to be a design thinker, while 80% of academic members entirely disagree that a lecture hall setting is best for learning to be a design thinker.

80% of academic members agree that hands-on activities are best for learning to be a design thinker. 93% of students strongly agree, according to Survey 2.

All academic members entirely agree a culture of collaboration and critique is best for learning to be a design thinker.

Survey 4—Elements of Design Thinking:

Thirty-seven percent of students somewhat disagree that they understood studio culture prior to Research-Design-Build, while 77% mostly agree that they understood it post Research-Design-Build. Seventy-four percent mostly agree that studio culture is valuable.

Discussion of Analyses

While studio culture is central to design education, it is not central to business education. Most business classes are taught in a lecture style in a tiered lecture hall. Students actively take notes on laptops, view projected lectures or business cases on screens, and are seated in rows.

However, in order for business students to learn to be design thinkers, they need to do so in an authentic environment to design, which invites and celebrates creativity, collaboration, and critique. This physical studio environment needs to be open, flexible, and flat, signalling to business students that they will be learning content that is different for them and that it requires a different way of interacting and absorbing content.

A studio environment enables business students to experience design thinking with actual hands-on activities that are public and highly visible. Many of the activities require posting content up on walls for feedback loops and critiques. This enables students to get out from behind their laptops, out of seated rows, and engage and collaborate in a highly interactive and stimulating way.

Design thinking is action-oriented and, in order to learn it, students need to be active physically and mindfully. The physical experience should inspire and promote creativity.

4.2.7 Theme 7: The Value and Competitive Advantage of Design Thinking to Business Students

Analysis of Interviews

Most students come to business school with a set of skills and perspectives that are often rooted in left-brain (analytical) skills and are further developed in business school. Specifically, several academic interviewees suggested that graduates leave business school with a baseline set of knowledge about how to run a business, and, hopefully, also a strategic mindset. According to these academic participants, most business students do not leave business school with skills in discovery, experimentation, and creativity that are prevalent with right brain thinking.

Additionally, one academic member suggested that the value of design thinking to business students is the ability to balance a strategic mindset with creativity. A common view amongst interviewees was that value is created through the integration of design thinking and business skills together.

It is this balance which provides an ability to address complex needs, enabling business students to look at the world with empathy towards others. It is this notion of empathy that further allows business students to discard preconceived assumptions. For example, it was suggested that the true value to business students is ‘humility’, which further supports this idea of seeing and acting with empathy. These are skills not readily supported or rigorously taught in depth in most business schools. A human-centred approach was specifically discussed as lacking in the business school curriculum.

Student comments further suggested that design thinking is a competitive skill above and beyond regular business students. According to one participant, many business school programmes are similar, but the opportunity to study design thinking ‘within my MBA’ was a differentiator. Another stated that design thinking was harder than they thought, but that the value of having a differentiated skill set for innovation through another set of tools is highly valuable.

Comments indicated that beyond research, skills such as rapid visualisation and storyboarding current and future states is very valuable. Additionally, the hands-on approach and collaborative nature of design thinking enable the students to feed off of each other and learn organically. Furthermore, the energy of a collaborative design thinking process inspires them.

Additionally, it is stated that empathy is highly valuable and that gaining insights through empathy was a differentiated skill.

Nearly all the students interviewed expressed in some way that design thinking was different and felt different from all their other business subjects. Furthermore, they suggest that many business students are sceptical of design thinking because it was so different to a business approach. However, once students have learned and applied a design thinking approach through a business challenge, they can see value more clearly as they themselves utilise the approach in a business context. The majority of student interviewees agreed that design research, synthesis, and problem-framing specifically prove to be highly valuable in addressing business challenges.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of the value of design thinking to business students:

AM 1:

> ‘[M]ost people come out of business schools with a certain set of knowledge…knowledge about how businesses run, and hopefully you have a strategic mindset. But real value comes with being able to balance your strategic mindset with creativity, and to feel confident in your ability to take your individual creativity and scale that creativity across your entire organization and build a creative culture within your organization.’

> ‘[T]he basic value of design thinking…you can truly only call yourself an innovation leader, again, if you have both the left-brain stuff that you usually learn in business school, but you balance that with the creativity and the creative leadership that you learn with design thinking in the right brain.’

AM 2:

> ‘I don’t think there’s a single industry that is not going to be radically transformed in the next ten years. And these students have to be part of that. And they’re not prepared to be part of it if they can’t adopt the mindset that we try to teach them in design thinking.’

> ‘[S]tarts with a mindset that allows them to identify and discard inappropriate assumptions.’

> ‘[T]the ability to really being able to frame and reframe.’

> ‘[W]e are teaching the students who are going to create the world that we’re all going to live in. And if they’re going to design that world, then they need a different way of understanding it and looking at it. And that’s not what we typically teach in business school. So yes, it does have to do with empathy.’

AM 3:

> ‘I can summarize it in one word, it’s humility…humility, hopefully, is translated into [this]—one is understanding the importance of greed, being open to devoting the time to empathizing with and connecting with the people’s problems they’re trying to solve. So that’s one version of humility….The second version of humility is understanding that the natural tendency of the organization to not be more open and experimental, and that it will actually double down on what’s been successful in the past, and that in order to develop radically different types of traditions…they have to follow a very different type of approach that is at least orthogonal to what the organization would normally and

traditionally try to do on its own. That includes a much more experimental and integrative approach; therefore, a different type of resource allocation.'

AM 4:

'[I]t's generally both a new toolkit and a new philosophy for most of them. We don't teach people to be human-centered anywhere else in the business school curriculum, which is the first thing design thinking does, and secondly, we teach people to analyze things using existing data as opposed to design and conduct experiments.'

'[T]he front-end of design thinking, with its emphasis on human-centered ethnographic methods, and the back-end of design thinking, with its emphasis on the design of prototypes and their use in small, quick experiments, is unique and of value to business students…these things don't really exist robustly, elsewhere in the curriculum of business schools, for the most part.'

AM 5:

'Design has a role in business, and when you have students that can actually integrate and use design thinking and business skills together, then you have something special. It's those students who have the capacity to integrate that can make a real difference in the world, and I think that's really important.'

Below are contextually rich extracts from seven students interviewed, which serve to further illustrate the theme of the value of design thinking to business students:

S 4:

‘My goal is to become a product manager, and I want to leverage my engineering background with my MBA to help get me there. But I soon realized when researching MBA programs, there were a lot of similarities. Design thinking was something I was aware of but didn’t fully understand, and the opportunity to study design thinking within my MBA was a differentiator.’

S 8:

‘I don’t think I fully realized the value of design thinking until I was deep into our project in Research-Design-Build. The sprints were helpful at first, but actually going into the field and utilizing the design research techniques was eye-opening.’

‘[E]mpathy seems a bit soft, but the empathy our team gained from our fieldwork informed where we took the project. Gaining insights through empathy proved to be a differentiator for sure.’

S 10:

‘First of all, it’s so different than what we’re learning in our regular business school classes. Design thinking has been harder than I thought it would be, by far. The value for me was having another set of tools to help me be a better innovator and a perspective that allowed me to understand people in a way that I didn’t know before. The qualitative research in the field was so very different from what we are exposed to in the business school.’

S 16:

‘Once we got deep into the project, I could see that the approach was very different from what I was used to as an engineer and what he had been taught so far in the business school. While the research and problem framing was critically valuable to the process, I got the most out of the rapid visualization of ideas and storyboarding current and future states.’

S 20:

‘The way I’ve approached problems from the users’ perspective first is very different from the business school and very valuable.’

‘Design research, synthesis, and problem framing have been the most valuable for me.’

S 21:

‘The value for me in design thinking was the collaboration. My background is in finance and working with a team was really powerful…feeding off the energy of each other. We got better at it each week for sure.’

‘[B]uilding off each other’s ideas was inspiring.’

S 22:

‘[T]he skills were very hands-on and collaborative…practicing design thinking in this way was empowering to me and my team.’

> ‘[C]reativity should be a bigger part of business education…design thinking is very creative.’

Analysis of Surveys

Students surveyed identified after learning design thinking that this approach enabled them to get closer to the true needs of users/customers, and in combination with business skills, they could see and lead more holistically as a business person.

They also identified that having a design thinking approach gave them a competitive advantage over business students who did not by enabling them to make more informed decisions through empathy and deep understanding of people, which may lead to more innovative solutions that address the right problems to solve.

Below are contextually rich survey extracts, which serve to further illustrate the theme of the value of design thinking to business students:

Survey 5—Design Thinking Differentiation and Competitive Advantage:

> 68% of students entirely agree, while 32% mostly agree, that a design thinking approach allows them to get closer to the true needs of users/customer in a way that a data-driven business approach could not, based on their classroom experiences.

> 89% of students entirely agree, while 11% mostly agree, that utilizing a design thinking approach in combination with a business approach allows them to see and lead more holistically.

92% of students entirely agree that business students who have learned a design thinking approach have a competitive advantage over business students who have not learned design thinking, based on their classroom experiences.

86% of students entirely agree that business students who have learned design thinking can utilize it to gain empathy and a deep understanding about users/customers than business students who have not learned design thinking, based on their classroom experiences.

86% of students entirely agree that design thinking is a valuable approach to identifying the right problem to solve for business students, based on their classroom experiences.

Discussion of Analyses

Business students are highly competitive individuals who seek to learn and polish skills that will enable them to get the next big job out of business school. For many of them, they came to business school to pivot into business roles that they did not qualify for before. They are highly motivated, intelligent, and purposeful in selecting the business schools they attend, the courses they take, and the instructors they learn from. If coursework does not directly apply in advancing them in their immediate pursuit of an internship or full-time employment, they will not take the course. The value and competitive advantage must be evident.

A design thinking approach is not for every business student, and in some cases, the value is not always realised by those who do study the subject. However, for those

business students who take the opportunity seriously and apply themselves in a way in which they immerse themselves deeply in the process with a focus on business outcomes, design thinking is valuable and is a competitive advantage.

That value and competitive advantage come from design thinking provides business students with a unique qualitative toolkit, enabling them to get closer and understand users/customers in a way that informs a deep sense of personal empathy, which traditional analytical business tools simply cannot. Empathy ultimately helps to inform business students on how to identify and frame problems, which then inspires the creation of new ideas. These ideas are brought to life through design visualisation tactics that are not used for aesthetic visualisation, but rather for the visual storytelling of ideas, so that others can build upon them in a collaborative way.

In the end, design thinking is a creative approach that is fundamentally rooted in empathy, which, in combination with an analytical business approach, can help inform, inspire, and shape solutions to business problems. The ability to successfully drive business outcomes is valuable, and those that have this hybrid integrated skillset have a distinct competitive advantage over those who do not.

4.2.8 Theme 8: Difficulties Business Students Have in Learning Design Thinking

Analysis of Interviews

Design thinking is generally an area of interest to business students, but one they seem to know little about. Business students come back to school with a set of practical skills, and they look to polish and develop more practical skills in business school. The subject of design thinking is so very different from most other subjects taught within business

schools that students often struggle to grasp the seriousness of the subject because they cannot see how to put design thinking into practice as they are learning it.

For example, it is critical that design thinking be directly connected to business and business outcomes in the classroom, and that learning design thinking in isolation will only impede the value of the subject because they will not understand how to use it in the context of their lives as business people. As such, business students will be resistant to learning.

Academic interviewees agreed that business students are not comfortable with ambiguity, and as such, they are quick to jump to conclusions they already have and develop a solution. They are also uncomfortable with empathy and that further complicates their willingness to go into the field and utilise design thinking research methods to understand real people and real problems.

Additionally, it is stated that the difficulty comes right down to business students defaulting to what they feel most comfortable with and what is generally supported within the business school, which is a quantitative approach rather than a qualitative approach based on discovery.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of the difficulties business students have in learning design thinking:

AM 1:

‘I think there’s a number of difficulties. First of all, for a lot of business school students, this is radically different from classes that they’ve taken before. It’s also something that’s not apparently evident exactly how it’s going to be used…in business school, there’s a certain notion of what you need to know and a certain way you do things with an MBA…even if you learn the skill sets of design thinking in terms of how you would think differently and how you would actually practice things differently. The impact of bringing design thinking into a business school classroom will vary.’

‘[W]hat’s challenging for business students is that they aren’t sure exactly how to put this into practice, even as they are learning it…they’re trying to relate it to their existing situations and saying, “Well, the things that you’re teaching me, these are all good in a bubble where everybody agrees…but I could never see how this would actually work in an organization.”’

‘Business students come back to school with practical experience. They’ve worked for a number of years. They may have even had management and leadership positions, so they understand how difficult it might be to take some of these new techniques and new ideas and bring them to fruition.’

AM 2:

‘The empathy quadrant is difficult. At least fifty percent of our business students struggle with empathy…that’s huge because we’re asking them to do something that’s as far away as possible from what they are comfortable doing.’

‘[E]mpathy is huge…a huge difficulty for them.’

‘[I]t’s hard for them not to converge too fast…part of that comes from flying through that insights quadrant where they’re not really stepping back and saying they heard their customers say something, and while they’re listening to the customer they’re coming up with an answer.’

‘[T]hey’re just slow to move. It’s not so much about making stuff…it’s about whether they’re willing to show that thing to someone else.’

‘Empathy, sharing ideas for feedback, and pivoting……because of the inability to let go of their answer…these are all difficult for business students.’

AM 3:

‘[T]hree types of issues that I constantly am battling in my classroom. One is there’s always a cynical minority who’s very difficult, if not impossible, to bring around…a lot of the content cannot be designed solely for the most enthusiastic students.

The second thing that is always going to be a challenge is that the rhythm of the types of exercises, the types of tasks, the types of sessions—kind of need to follow it from a rhythm. This is different from everything else that they do in business school.

Lastly is timing. The most common thing for our MBA students to do is to break up the tasks and sort of do a divide-and-conquer type of approach which is the opposite of what you need for design thinking activities.’

AM 4:

‘Most of them are inherently not all that comfortable with ambiguity. They really do think there’s a right answer and we just haven’t told them what it is. So the ambiguity makes them uncomfortable.’

‘[D]oing ethnography makes them uncomfortable…and then engage people you don't know in pretty deep conversations about the issue you’re trying to resolve, all of that is challenging for them.’

‘As data-driven as our students are and as good with data as our students are, what we normally do, I think, in most business applications is we teach students to take the data they’ve got and answer questions with it; whereas, in design thinking, we’re reversing that and trying to teach them how to be hypothesis-driven…but becoming hypothesis-driven is not easy.’

‘[F]or business students who are uncomfortable with ambiguity, the structure is really important in helping them to manage their discomfort.’

AM 5:

‘[I]t goes right to the matter of quantitative and qualitative. Business students default back to what they know and what they feel comfortable with. They’re often caught up proving something to be right through data—rather than discovering.’

‘Invention and creativity is also difficult for them primarily because it’s out of their comfort zone and it’s very different from all the other management

> coursework they do. I do think creativity can be taught and there are techniques for doing so. However, you need to be open-minded to it.'

Analysis of Surveys

Students surveyed identified that design thinking can be learned and utilised successfully, even though business skills and design thinking skills are different from each other. It is also recognised that the learning environment and experiences are very different. As such, business students may struggle to find a balance, as the majority of their course work is based on business approaches learned in business environments. The students also approach design thinking without any prior creative or design skills, as noted in Survey 1, which makes these new concepts difficult to grasp at first.

Below are contextually rich survey extracts, which serve to further illustrate the theme of the difficulties business students have in learning design thinking:

Survey 2—Post-RDB (Research-Design-Build):

> 97% of students strongly agreed that a design thinking approach to problems is different than a business approach to problems, based on their classroom experiences.

> 93% of students strongly agreed that environment for learning design thinking invites exploration, while 74% disagree that the environment for learning business skills invites exploration, based on their classroom experiences.

100% of students strongly agreed that environment for learning design thinking invites collaboration, while 59% disagree that the environment for learning business skills invites collaboration, based on their classroom experiences.

100% of students strongly agreed that environment for learning design thinking invites creativity, while 75% disagree that the environment for learning business skills invites creativity, based on their classroom experiences.

Survey 4—Elements of Design Thinking

Students mostly agree that specific elements of design thinking were difficult to learn based on their classroom experience.

Survey 5—Design Thinking Differentiation and Competitive Advantage:

89% of students entirely agree that business students can learn and utilize a design thinking approach, based on their classroom experiences.

Discussion of Analyses

For many business students, design thinking seems like an interesting topic they have read about in popular press publications prior to coming to business school. However, most do not have actual experience with the subject and the tactics that are associated with the approach. Design thinking requires business students to reframe the way they address problems and to consider *what is possible* over *what is probable* in the early stages of the process, which is in direct conflict to the proof-based approach taught in many business school classes. Design thinking also requires business students to be patient and to remain in the discovery phase longer before jumping too quickly into the solution phase, which is difficult for business students because the sooner they get to a

solution, the sooner they can utilise trusted business skills to optimise and scale the solution. Additionally, design thinking requires business students to apply themselves to the process through a hands-on tactical immersive approach that often makes them feel uncomfortable and intimidated because they do not have a background or history with the tactics. Finally, design thinking requires a creative and optimistic mindset that is often in conflict with the practical and devil's advocate mindset of many business students.

4.2.9 Theme 9: The Complexity of Seeing Value in Design Thinking for Business Students

Analysis of Interviews

Seeing the value of design thinking in the curriculum of business is not always readily clear to all students. Design thinking can be viewed as not serious or rigorous in the minds of some students, who are not willing to deeply immerse themselves in the design thinking process. The hard work needed to see the value in design thinking takes time and patience, and this often feels unnatural to business students.

Academic interviewees noted that business students often lack the patience required to deeply understand people, which is critical to design thinking, further stating that business students are intelligent and they know it, which makes them less willing to try something new, even though they sense the value in design thinking. All academic participants agreed that in order for business students to truly see the value in the curriculum, they need to experience it first-hand and practise it at a deeper level. It is through the practice of deeper thinking and deeper understanding that they can get to empathy, which is not a subject they are comfortable with.

Additionally, all the academics interviewed agreed that design thinking was hard work and was not for all business students. For example, one interviewee said that in order for business students to see value in design thinking, it had to be taught in a serious way that business students could respect. This interviewee further claimed that design thinking is not a superficial process but rather should be taught in a way that elevated and connected its importance to business outcomes and business value.

Below are contextually rich extracts from five academics interviewed, which serve to further illustrate the theme of the complexity of seeing value in design thinking for business students:

AM 1:

> ‘Design thinking is not necessarily for everyone, and for many business students it’s not something that comes to them naturally. Which often leads them to push away from it, even though they may sense there could be value.’

> ‘The value needs to be realized through a deeper application of the tools and mindset associated with design thinking.’

AM 2:

> ‘I think if we keep teaching design as if it’s just this cute little process when it’s hard work to actually get the insights, we’re doing a disservice.’

> ‘I would argue that MBAs are not patient and that they spend a great deal of time doing shallow work and not deep work.’

‘I think we’re asking students to do deep work in a setting in which mostly they don’t have to. And so, when you say, “No, this requires really digging in and putting stuff on the walls and seeing if it sticks, I don’t know if you’re going to have the answer by the end of class today,” it’s so different than what they’ve been rewarded for doing and they aren’t—the muscles aren’t there.’

AM 3:

‘It requires a different type of pedagogy than what we normally would do for other kinds of things. And so again, the pedagogy is designed well in a way that pedagogy is human-centered, meaning understanding who your students are, where they’re starting from, what their backgrounds are, what their biases are, what their weaknesses are, all those things, and if you start from that and you design a pedagogy that incorporates that, then yes. But I don’t think it’s trivial and I don’t think that it’s automatic.’

‘The majority of them have solved the type of problems, sort of the same types of problems, and with certain mythologies that fit better into less obstructed set of problems…often using an analytic approach.’

‘They actually tend to feel a little bit uncomfortable when you talk about emotions and about connecting with others in a deeper way. That’s not their zone of comfort. It actually brings them discomfort. So that’s another way in which their starting point is not necessarily an openness to this.’

‘What I mean by automatic is that just by showing them the information they’re not going to get it. And that’s where the pedagogy of these things is radically

different from the pedagogy of other things. Design thinking requires a different type of pedagogy.'

AM 4:

'Business students come to design thinking with interest and skepticism. In order for them to see the value, they need to experience the process first-hand. The difficulty is getting them to engage at a deep level.'

'They are generally data-driven, and so getting them to wrap their heads around seeing and using different kinds of data is in the end valuable.'

AM 5:

'It's a matter of depth. If you want to understand people in a truly meaningful way, design thinking education needs to move beyond the teaching of craft or simply process. Business students often see design thinking as a surface-level value.'

'There needs to be a greater focus on depth and problem finding within design thinking education. What is the real problem? And what are we trying to solve? If we can answer those questions, we can get closer to developing more meaningful ideas. But again, I am concerned that business schools and consultants simply focus on the craft of process, which so often leads to basic solutions. Without any depth, you are only making surface-level decisions that most likely will not be as meaningful as you had hoped.'

Analysis of Surveys

Prior to coming to business school, student participants had little understanding of empathy and its use. They also did not have a design thinking background, and design thinking was not used in their workplace before coming to business school. Students surveyed did recognise the value of design thinking, but they also identified in Survey 4 that certain elements were difficult to learn. As such, business students may rely on their analytical backgrounds to understand people and solve problems, rather than a design thinking approach.

Below are contextually rich survey extracts, which serve to further illustrate the theme of the complexity of seeing value in design thinking for business students:

Survey 1—Pre-RDB (Research-Design-Build):

> 74% of students surveyed agree that prior to coming to business school their business skill set was analytical. Additionally, 83% strongly agree that they are confident using analytical approaches to solve problems.

> 63% of students surveyed were neutral on if design thinking is valuable in the business prior to taking the design thinking class, Research-Design-Build.

Survey 5—Design Thinking Differentiation and Competitive Advantage:

> 84% of students surveyed entirely agree that design thinking is a valuable approach to problem-solving for business students, based on their classroom experiences.

Discussion of Analyses

The success of design thinking is not automatic for business students or for business schools. Design thinking needs to be carefully framed as a way of problem-finding and, ultimately, problem-solving. Yet, in many cases, design thinking is treated as a fun, creative process in business school workshops, most often not directly tied to the curriculum. Seeing and experiencing design thinking in this way diminishes the value and propagates the notion that design thinking is not rigorous and as such, not a serious subject for business students or the business school.

Design thinking in the business school needs to be taught in a serious and thoughtful way that fully engages and challenges its audience—business students. They are not art students, nor are they design students. They are business students who focus predominantly on an analytical process and who will most likely work in a business environment that is not design thinking-centric.

However, design thinking requires them to be creative and to be human-centred. This complexity ultimately reinforces the idea that business students who study design thinking cannot simply be told it is valuable because that will not resonate with their practical nature.

Business students need to learn design thinking and realise the value first-hand, by engaging in a structured, immersive experience through a contextual project that is directly framed by business constraints, which challenges them to discover, frame, create, and deliver a unique, innovative business outcome that meets or exceeds user/customer desirability and business feasibility and viability. By doing so, business

students and business schools can see and experience the rigour, application, and perhaps, ultimately, the value of design thinking in business.

4.3 Surveys

Business students participated in a series of surveys intended to measure their background before business school, their understanding and utilisation of a design thinking approach and methods, the context for learning design thinking, and the value they place on the differentiation and competitive advantage of a design thinking approach as a business student. Academic members participated in a survey specifically around what is important for business students when learning to be a design thinker. Specific measurements from the following surveys were utilised to shape the themes above. The surveys are presented below in rigorous detail.

4.3.1 Survey 1—Pre-RDB (Research-Design-Build)

Context

This voluntary survey was conducted over a three-year period in which 180 business students from the Kellogg School of Management participated. These business students had not yet taken the design thinking course, Research-Design-Build (RDB).

Intent

The intent was to understand the students' background in analytics and creativity, quantitative and qualitative data, empathy, and design thinking before business school and prior to taking the design thinking class.

Specifics

A breakdown of student's response per statement can be found in Appendix D. Findings follow on subsequent pages here.

Survey 1 Findings

Table 18. Results of Pre-RDB Survey: Analytics and Creativity

SECTION 1 – ANALYTICS AND CREATIVITY — **180 STUDENTS SURVEYED**

1. Prior to coming to business school my business skill set was analytical.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
18%	**74%**	0%	8%	0%

2. I am confident using analytical approaches to solve problems.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
83%	11%	0%	6%	0%

3. Prior to coming to business school my business skill set was creative.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	0%	32%	**68%**

4. I am confident using creative approaches to solve problems.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	0%	26%	**74%**

5. Prior to coming to business school my business skill set was both analytical and creative.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	0%	**81%**	19%

6. I am confident using both analytical approaches and creative approaches to solve problems.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	0%	**89%**	11%

7. Analytics is valuable in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
93%	7%	0%	0%	0%

8. Creativity is valuable in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	20%	38%	**42%**	0%

9. Analytics is more valuable than creativity in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
8%	**84%**	8%	0%	0%

10. Creativity is more valuable than analytics in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	8%	3%	**89%**

11. Analytics and creativity are equally valuable in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	14%	8%	22%	**56%**

Table 19. Results of Pre-RDB Survey: Quantitative and Qualitative

SECTION 2 – QUANTITATIVE AND QUALITATIVE — **180 STUDENTS SURVEYED**

1. Prior to coming to business school I used quantitative data to inform decisions regarding users / customers in my work practice.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
9%	**91%**	0%	0%	0%

2. Prior to coming to business school I used qualitative data to inform decisions regarding users / customers in my work practice.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	6%	0%	21%	**73%**

3. Prior to coming to business school I used a combination of both quantitative and qualitative data to inform decisions regarding users / customers in my work practice.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	6%	0%	23%	**71%**

4. Quantitative data regarding users / customers is valuable in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
74%	26%	0%	0%	0%

5. Qualitative data regarding users / customers is valuable in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	42%	**48%**	10%	0%

6. Quantitative data regarding users / customers is more valuable than qualitative data regarding users / customers in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
6%	**71%**	8%	15%	0%

7. Qualitative data regarding users / customers is more valuable than quantitative data regarding users / customers in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	17%	8%	**68%**	7%

8. Quantitative and qualitative data regarding users / customers are equally important in the business world.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	17%	23%	**55%**	5%

Table 20. Results of Pre-RDB Survey: Empathy

SECTION 3 – EMPATHY				180 STUDENTS SURVEYED
1. Prior to coming to business school, empathy informed my decisions regarding users / customers in my work practice.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	6%	3%	**69%**	22%
2. Empathy was important in understanding users/customers in my work practice.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	5%	24%	**65%**	6%
3. I am comfortable using empathy.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	6%	3%	**87%**	4%
4. Empathy is valuable in the business world.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
18%	27%	**42%**	13%	0%

Table 21. Results of Pre-RDB Survey: Design Thinking

SECTION 4 – DESIGN THINKING				180 STUDENTS SURVEYED
1. Prior to coming to business school I used a design thinking approach to solve problems in my work practice.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	0%	17%	**83%**
2. I am confident using a design thinking approach to solve problems.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	0%	6%	**94%**
3. Design thinking is valuable in the business world.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
5%	25%	**63%**	7%	0%

4.3.2 Survey 2—Post-RDB (Research-Design-Build)

Context

This voluntary survey was conducted over a three-year period in which 180 business students from the Kellogg School of Management participated. These business students had completed the design thinking course, Research-Design-Build (RDB).

Intent

The intent was to understand the students' experience with a design thinking approach, the environment for learning, how we inform empathy and decisions through data, and the context for learning design thinking after having taken the first design thinking class.

Specifics

A breakdown of student's response per statement can be found in Appendix E.

Survey 2 Findings

Table 22. Results of Post-RDB Survey: Design Thinking Approach

SECTION 1 – DESIGN THINKING APPROACH — **180 STUDENTS SURVEYED**

1. A design thinking approach to problems is different than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
97%	3%	0%	0%	0%

2. A design thinking approach to problems is more exploratory than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
82%	14%	4%	0%	0%

3. A design thinking approach to problems is more collaborative than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
85%	3%	4%	8%	0%

4. A design thinking approach to problems is more creative than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
87%	8%	0%	5%	0%

5. A design thinking approach to problems is more visual than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
96%	4%	0%	0%	0%

6. A design thinking approach to problems is more experimental than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
94%	6%	0%	0%	0%

7. A design thinking approach to problems is more human centered than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
93%	0%	7%	0%	0%

8. A design thinking approach to problems is more hands-on than a business approach to problems, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
84%	16%	0%	0%	0%

Table 23. Results of Post-RDB Survey: Environment for Learning, 1–7

SECTION 2 – ENVIRONMENT FOR LEARNING — **180 STUDENTS SURVEYED**

1. The environment for learning design thinking is different than an environment for learning business skills, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
100%	0%	0%	0%	0%

2. The environment for learning design thinking invites exploration, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
93%	7%	0%	0%	0%

3. The environment for learning business skills invites exploration, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	8%	6%	74%	12%

4. The environment for learning design thinking invites collaboration, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
100%	0%	0%	0%	0%

5. The environment for learning business skills invites collaboration, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	23%	18%	59%	0%

6. The environment for learning design thinking invites creativity, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
100%	0%	0%	0%	0%

7. The environment for learning business skills invites creativity, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	6%	9%	75%	10%

Table 24. Results of Post-RDB Survey: Environment for Learning, 8–13

SECTION 2 – ENVIRONMENT FOR LEARNING — **180 STUDENTS SURVEYED**

8. The environment for learning design thinking invites experimentation, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
91%	9%	0%	0%	0%

9. The environment for learning business skills invites experimentation, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	11%	0%	**86%**	3%

10. The environment for learning design thinking invites critique, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
93%	7%	0%	0%	0%

11. The environment for learning business skills invites critique, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	21%	0%	**71%**	8%

12. The environment for learning design thinking is often outside the structured classroom, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
78%	22%	0%	0%	0%

13. The environment for learning business skills is often inside the structured classroom, based on my classroom experiences.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
6%	**81%**	0%	13%	0%

Table 25. Results of Post-RDB Survey: Informing Empathy and Decisions

SECTION 3 – INFORMING EMPATHY AND DECISIONS THROUGH DATA — **180 STUDENTS SURVEYED**

1. Quantitative data lead me to empathy for the user/customer, which shaped my decisions on how to address the project challenge in class.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	0%	**84%**	16%

2. Qualitative data lead me to empathy for the user/customer, which shaped my decisions on how to address the project challenge in class.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
89%	11%	0%	0%	0%

3. Quantitative data proved to be the most valuable resource, when shaping my decisions on how to address the project challenge in class.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
0%	0%	9%	**79%**	12%

4. Qualitative data proved to be the most valuable resource, when shaping my decisions on how to address the project challenge in class.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
7%	**84%**	9%	0%	0%

5. A combination of both quantitative and qualitative data proved to be the most valuable resource, when shaping my decisions on how to address the project challenge in class.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
21%	**79%**	0%	0%	0%

Table 26. Results of Post-RDB Survey: Context for Learning Design Thinking

SECTION 4 – CONTEXT FOR LEARNING DESIGN THINKING				180 STUDENTS SURVEYED
1. Learning design thinking through a guided and structured process was effective in Research Design Build.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
21%	79%	0%	0%	0%
2. Learning design thinking through a hands-on approach was effective in Research Design Build.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
93%	7%	0%	0%	0%
3. Learning design thinking through a project-based experience was effective in Research Design Build.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
91%	9%	0%	0%	0%
4. Learning design thinking through a real business challenge was effective in Research Design Build.				
STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
93%	7%	0%	0%	0%

4.3.3 Survey 3—Learning to Be a Design Thinker

Context

This voluntary survey was conducted with 5 peer academic members—not at the Kellogg School of Management—who teach innovation-centric content at business schools within their respective university. Design thinking is part of what they teach. The participants represented business school institutions ranked in the top 10 in the United States as well as recognised academic thought leaders. These academic members do not teach the course Research-Design-Build (RDB). However, core innovation concepts, including design thinking, are within the domain of the coursework they teach.

Intent

The intent was to understand what is important for students when learning to be a design thinker from peer academic members who teach design thinking at business school institutions.

Specifics

A breakdown of academic members' response per statement can be found in Appendix F. Findings follow on subsequent pages here.

Survey 3 Findings

Table 27. Results of Learning to Be a Design Thinker Survey, 1–8

LEARNING TO BE A DESIGN THINKER — **5 ACADEMIC MEMBERS SURVEYED**

1. Case studies are best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	0%	0%	0%	20%	**80%**

2. Lectures are best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	20%	0%	0%	**60%**	20%

3. Readings are best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	20%	0%	0%	**60%**	20%

4. Project-based experiences are best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%

5. Integrating real business constraints and considerations are best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
20%	**80%**	0%	0%	0%	0%	0%

6. A lecture hall setting is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	0%	0%	20%	0%	**80%**

7. A studio-based experience is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
80%	20%	0%	0%	0%	0%	0%

8. Open mindedness is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%

Table 28. Results of Learning to Be a Design Thinker Survey, 9–16

LEARNING TO BE A DESIGN THINKER — **5 ACADEMIC MEMBERS SURVEYED**

9. Hands-on activities are best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
80%	20%	0%	0%	0%	0%	0%

10. A culture of critique is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%

11. A culture of collaboration is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%

12. Small teams are best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
80%	20%	0%	0%	0%	0%	0%

13. Teaching individually is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	20%	0%	0%	**80%**	0%

14. Teaching in teams is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**80%**	0%	0%	20%	0%	0%

15. Utilizing a systematic and repeatable process is best for learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
20%	**80%**	0%	0%	0%	0%	0%

16. Creativity is an important part of learning to be a design thinker.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
20%	**80%**	0%	0%	0%	0%	0%

Table 29. Results of Learning to Be a Design Thinker Survey, 17–24

LEARNING TO BE A DESIGN THINKER						5 ACADEMIC MEMBERS SURVEYED
17. Field research is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%
18. Gaining empathy for people is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%
19. Identifying the right problem to solve is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
80%	20%	0%	0%	0%	0%	0%
20. Framing the right problem to solve is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%
21. Visualizing ideas is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	80%	20%	0%	0%	0%	0%
22. Developing more than one solution is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
20%	80%	0%	0%	0%	0%	0%
23. Prototyping is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
20%	80%	0%	0%	0%	0%	0%
24. Iterating solutions is an important part of learning to be a design thinker.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
100%	0%	0%	0%	0%	0%	0%

4.3.4 Survey 4—Elements of Design Thinking

Context

This voluntary survey was conducted over a two-year period in which 120 business students from the Kellogg School of Management participated. These business students had just completed the design thinking course, Research-Design-Build (RDB).

Intent

The intent was to understand the students' experience before and after Research-Design-Build (RDB), the difficulties in learning, and the value they place after their design thinking experience with the following specific design thinking elements: ethnographic research, empathy, identifying the right problem to solve, framing the right problem to solve, visualizing ideas, developing more than one solution, storyboarding, prototyping, iterating solutions, critique, creativity, and studio culture.

Specifics

A breakdown of students' responses per statement can be found in Appendix G.

Findings follow on subsequent pages here.

Survey 4 Findings

Table 30. Results of Post RDB Survey (Ethnographic Research and Empathy)

ELEMENTS OF DESIGN THINKING — **120 STUDENTS SURVEYED**

> ETHNOGRAPHIC RESEARCH

1. Before taking Research Design Build, I understood ethnographic research.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	11%	0%	24%	31%	**34%**

2. After taking Research Design Build, I understood ethnographic research.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**81%**	12%	0%	7%	0%	0%

3. During Research Design Build, I found learning how to conduct ethnographic research difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
17%	**76%**	7%	0%	0%	0%	0%

4. As a business student, I find ethnographic research valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
73%	8%	6%	0%	13%	0%	0%

> EMPATHY

1. Before taking Research Design Build, I understood empathy.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	15%	27%	0%	4%	**46%**	8%

2. After taking Research Design Build, I understood empathy.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**77%**	15%	0%	8%	0%	0%

3. During Research Design Build, I found learning how to gain empathy difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
21%	**59%**	6%	0%	14%	0%	0%

4. As a business student, I find empathy valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
77%	23%	0%	0%	0%	0%	0%

Table 31. Results of Post RDB Survey (Identifying and Framing)

ELEMENTS OF DESIGN THINKING — **120 STUDENTS SURVEYED**

> IDENTIFYING THE RIGHT PROBLEM TO SOLVE

1. Before taking Research Design Build, I understood how to identify the right problem to solve

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	36%	0%	**49%**	15%	0%

2. After taking Research Design Build, I understood how to identify the right problem to solve.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**78%**	22%	0%	0%	0%	0%

3. During Research Design Build, I found learning how to identify the right problem to solve difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**69%**	31%	0%	0%	0%	0%

4. As a business student, I find how to identify the right problem to solve valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
89%	11%	0%	0%	0%	0%	0%

> FRAMING THE RIGHT PROBLEM TO SOLVE

1. Before taking Research Design Build, I understood how to frame the right problem to solve.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	19%	0%	**67%**	14%	0%

2. After taking Research Design Build, I understood how to frame the right problem to solve.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**71%**	16%	0%	13%	0%	0%

3. During Research Design Build, I found learning how to frame the right problem to solve difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	16%	**54%**	0%	30%	0%	0%

4. As a business student, I find how to frame the right problem to solve valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
86%	14%	0%	0%	0%	0%	0%

Table 32. Results of Post RDB Survey (Visualizing and Developing)

ELEMENTS OF DESIGN THINKING — **120 STUDENTS SURVEYED**

> VISUALIZING IDEAS

1. Before taking Research Design Build, I understood how to visualize ideas.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	18%	0%	0%	67%	15%

2. After taking Research Design Build, I understood how to visualize ideas.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	48%	29%	0%	16%	7%	0%

3. During Research Design Build, I found learning how to visualize ideas difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
71%	12%	8%	0%	9%	0%	0%

4. As a business student, I find how to visualize ideas valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
14%	68%	18%	0%	0%	0%	0%

> DEVELOPING MORE THAN ONE SOLUTION

1. Before taking Research Design Build, I understood how to develop more than one solution.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	61%	0%	28%	11%	0%

2. After taking Research Design Build, I understood how to develop more than one solution.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
9%	78%	5%	0%	8%	0%	0%

3. During Research Design Build, I found learning how to develop more than one solution difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	66%	18%	0%	16%	0%	0%

4. As a business student, I find how to develop more than one solution valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
15%	79%	6%	0%	0%	0%	0%

Table 33. Results of Post RDB Survey (Storyboarding and Prototyping)

ELEMENTS OF DESIGN THINKING — **120 STUDENTS SURVEYED**

> STORYBOARDING

1. Before taking Research Design Build, I understood how to storyboard.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	8%	0%	0%	**74%**	18%

2. After taking Research Design Build, I understood how to storyboard.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**52%**	24%	0%	14%	10%	0%

3. During Research Design Build, I found learning how to storyboard difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
65%	18%	17%	0%	0%	0%	0%

4. As a business student, I find how to storyboard valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
14%	**61%**	25%	0%	0%	0%	0%

> PROTOTYPING

1. Before taking Research Design Build, I understood how to prototype.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	26%	16%	**44%**	5%	9%

2. After taking Research Design Build, I understood how to prototype.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
8%	**58%**	25%	0%	9%	0%	0%

3. During Research Design Build, I found learning how to prototype difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
14%	13%	**31%**	0%	27%	15%	0%

4. As a business student, I find how to prototype valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
19%	**66%**	8%	0%	7%	0%	0%

Table 34. Results Post RDB Survey (Iterating and Critique)

ELEMENTS OF DESIGN THINKING						120 STUDENTS SURVEYED
> ITERATING SOLUTIONS						
1. Before taking Research Design Build, I understood how to iterate solutions.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	23%	**44%**	0%	21%	12%	0%
2. After taking Research Design Build, I understood how to iterate solutions.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
16%	**69%**	15%	0%	0%	0%	0%
3. During Research Design Build, I found learning how to iterate solutions difficult.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	**71%**	18%	0%	11%	0%	0%
4. As a business student, I find how to iterate solutions valuable.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
15%	**73%**	12%	0%	0%	0%	0%
> CRITIQUE						
1. Before taking Research Design Build, I understood how to critique.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	16%	**38%**	21%	18%	7%	0%
2. After taking Research Design Build, I understood how to critique.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
33%	**54%**	8%	0%	5%	0%	0%
3. During Research Design Build, I found learning how to critique difficult.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	22%	30%	0%	**39%**	9%	0%
4. As a business student, I find how to critique valuable.						
ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
68%	32%	0%	0%	0%	0%	0%

Table 35. Results of Post RDB Survey (Creativity and Studio Culture)

ELEMENTS OF DESIGN THINKING — **120 STUDENTS SURVEYED**

> CREATIVITY

1. Before taking Research Design Build, I understood how to be creative.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	12%	0%	**46%**	33%	9%

2. After taking Research Design Build, I understood how to be creatives.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
12%	**59%**	14%	0%	15%	0%	0%

3. During Research Design Build, I found learning how to be creative difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
41%	**48%**	0%	0%	11%	0%	0%

4. As a business student, I find how to be creative valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
18%	**69%**	6%	7%	0%	0%	0%

> STUDIO CULTURE

1. Before taking Research Design Build, I understood studio culture.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	0%	18%	9%	**37%**	22%	14%

2. After taking Research Design Build, I understood studio culture.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
23%	**77%**	0%	0%	0%	0%	0%

3. During Research Design Build, I found studio culture difficult.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
0%	7%	21%	0%	6%	29%	**37%**

4. As a business student, I find studio culture valuable.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
7%	**74%**	19%	0%	0%	0%	0%

4.3.5 Survey 5—Design Thinking Differentiation and Competitive Advantage

Context

This voluntary survey was conducted over a three-year period in which 180 business students from the Kellogg School of Management participated. These business students had completed the design thinking course, Research-Design-Build (RDB).

Intent

The intent was to understand the value the students place on design thinking as a differentiator and a competitive advantage after having taken the design thinking course, Research-Design-Build (RDB).

Specifics

A breakdown of student's response per statement can be found in Appendix H. Findings follow on subsequent pages here.

Survey 5 Findings

Table 36. Results of Post RDB Survey (Differentiation)

SECTION 1 – DESIGN THINKING DIFFERENTIATION — **180 STUDENTS SURVEYED**

1. A design thinking approach to problems is different than a business approach to problems, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
91%	9%	0%	0%	0%	0%	0%

2. A design thinking approach gives me another set of tools to identify and solve problems for users/customer, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
88%	12%	0%	0%	0%	0%	0%

3. A design thinking approach allows me to understand users/customer in a way that a data driven business approach could not, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
27%	64%	9%	0%	0%	0%	0%

4. A design thinking approach allows me to get closer to the true needs of users/customer in a way that a data driven business approach could not, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
68%	32%	0%	0%	0%	0%	0%

5. Utilizing a design thinking approach in combination with a business approach, allows me to see and lead more holistically.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
89%	11%	0%	0%	0%	0%	0%

Table 37. Results of Post RDB Survey (Competitive Advantage)

SECTION 2 – DESIGN THINKING COMPETITIVE ADVANTAGE — **180 STUDENTS SURVEYED**

1. Business students can learn and utilize a design thinking approach, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
89%	5%	6%	0%	0%	0%	0%

2. Business students who have learned a design thinking approach have a competitive advantage over business students who have not learned design thinking, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
92%	5%	3%	0%	0%	0%	0%

3. Business students who have learned design thinking can utilize it to gain empathy and a deep understanding about users / customers than business students who have not learned design thinking, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
86%	9%	5%	0%	0%	0%	0%

4. Business students who have learned design thinking can utilize it to make more informed decisions about users / customers than business students who have not learned design thinking, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
82%	18%	0%	0%	0%	0%	0%

5. Business students who have learned design thinking can utilize it to develop more innovative solutions for users / customers than business students who have not learned design thinking, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
67%	18%	15%	0%	0%	0%	0%

6. Design thinking is a valuable approach to identifying the right problem to solve for business students, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
88%	12%	0%	0%	0%	0%	0%

7. Design thinking is a valuable approach to problem solving for business students, based on my classroom experiences.

ENTIRELY AGREE	MOSTLY AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	MOSTLY DISAGREE	ENTIRELY DISAGREE
84%	5%	11%	0%	0%	0%	0%

4.4 Interviews

4.4.1 Academic Members

A voluntary, in-depth, one-on-one interview was conducted with 5 peer academic members at other business school institutions. The participants represented business school institutions ranked in the top 10 in the United States as well as recognised academic thought leaders at business school institutions not ranked in the top 10 in the United States. These individuals teach innovation-centric content that includes design thinking to business students within the school of business at their respective universities. The intent is to understand in greater depth how design thinking is utilised at their respective universities, its importance in business school education, the understanding and impact of design thinking in the decision-making of their students, success stories, struggles, and overall value of the topic.

4.4.2 Students

A voluntary, in-depth, one-on-one interview was conducted with 25 business students, who had just completed Research-Design-Build (RDB). This subset of students also participated in the surveys. The intent is to understand in greater depth the backgrounds of the students, their business school academic experiences, their Research-Design-Build (RDB) experiences and their overall experiences with the teaching, learning, and language used in design thinking.

4.4.3 Interview Content

Specific qualitative quotations from both the academic and student interviews are utilised to identify and shape the themes captured above, providing a contextual

richness to each theme. A sample of one academic member interview and one student interview can be found in their entirety in Appendix L and Appendix P. Additionally, specific keywords are measured to provide quantitative frequency data, which provided input to thematic identification.

Interview—Academic Members

Interview Questionnaire

1. Within your business school institution, is design thinking taught as part of the core MBA curriculum?
2. Is design thinking an important part of a twenty-first-century business school education?
3. Does the introduction of design thinking to the curriculum of business students improve their understanding of user needs in their decision making?
4. Does increasing the understanding and use of design thinking have an impact on business decision making with respect to meeting user needs in a meaningful way?
5. How have your business students learned design thinking best?
6. What difficulties have your business students had in learning design thinking?
7. What have you found to be the ideal environment for business students to learn design thinking?
8. What elements of the design thinking process have you found to be valuable for business students to learn?
9. What is the value of design thinking to business students?

Academic Interview Keyword Frequency Findings

In order to measure the interview content frequency, coding categories were identified by the researcher and reviewed and verified by a neutral peer academic member. The final codes were then utilised by a neutral party, not the researcher, within the software, QDA Miner. QDA Miner is qualitative data analysis software that measures the frequency of data codes with the data set. This informed the next level of coding and thematic identification. The ‘difficulty in learning design thinking’ had the highest number of statistical frequency counts and percentage of codes identified in the interviews. The QDA Miner raw outputs can be found in Appendix R.

Table 38 and Table 39 below illustrate academic member interview coding and interview content frequency.

Table 38. Academic Member Interview Coding

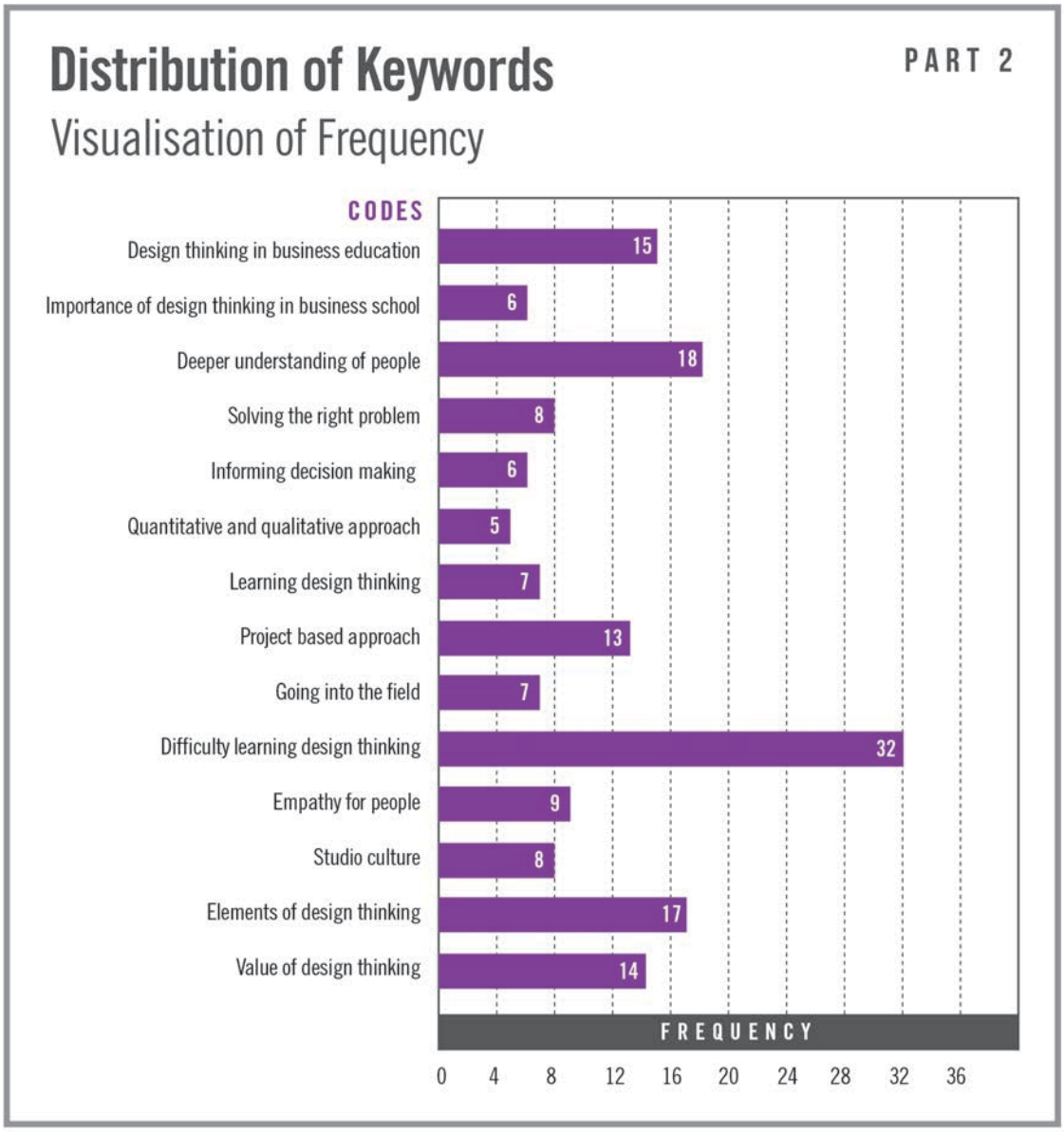
Academic Member Interview Coding

PART 1

Specifics

CATEGORY	CODE	COUNT	% OF CODES	NUMBER OF CASES	% OF CASES
Education	Design thinking in business education	15	9.10%	5	100%
Importance	Importance of design thinking in business school	6	3.60%	5	100%
Deeper Understanding	Deeper understanding of people	18	10.90%	5	100%
Problem Finding	Solving the right problem	8	4.80%	3	60%
Decision Making	Informing decision making	6	3.60%	4	80%
Quantitative and Qualitative	Quantitative and qualitative approach	5	3.00%	4	80%
Learning	Learning design thinking	7	4.20%	3	60%
Project based	Project based approach	13	7.90%	5	100%
Field research	Going into the field	7	4.20%	5	100%
Difficulties	Difficulty learning design thinking	37	19.40%	5	100%
Empathy	Empathy for people	9	5.50%	4	80%
Studio	Studio culture	8	4.80%	4	80%
Elements	Elements of design thinking	17	10.30%	5	100%
Value	Value of design thinking	14	8.50%	5	100%

Table 39. Distribution of Keywords



Interview—Students

Interview Questionnaire

<u>Part A</u>

Tell me about your background prior to coming to business school to earn an MBA.

1. Where did you go for your undergraduate education?

2. What did you study?
3. What was your degree?
4. Where was your last job prior to coming to graduate school for your MBA?
5. What was your primary function?
6. Did this organization have an innovation process?
7. If so, was their innovation process successful?
8. If so, did their innovation process inform the decision-making process for the organization?
9. Did your past organization employ empathic methods as part of its innovation process?
10. Prior to coming to graduate school for your MBA, did you personally use empathic methods within your innovation process in the business world?
11. Prior to coming to graduate school for your MBA, how confident were you using empathic methods as part of your innovation process in the business world?

Part B

Tell me about your MBA experience.

1. Why did you decide to go back to school and earn an MBA?
2. Describe to me the core MBA curriculum that you are taking.
3. What skills are stressed as part of the core MBA curriculum that you are taking?

Part C

Tell me about your experience using the tools and perspective taught to you in the Research-Design-Build (RDB) class at Northwestern University.

1. In the design thinking process that you were taught, was qualitative ethnographic research valuable in identifying user needs?
2. Did qualitative ethnographic research yield a more empathic understanding of users?
3. Were the decisions you made relating to the innovation process and outcomes of better quality when they were informed through design thinking?

Part D

The following are thematic questions around design thinking, decision-making, empathy, etc., as per the research.

1. In your opinion, can increasing the understanding and use of design thinking have an impact on business decision making with respect to meeting user needs?
2. In your opinion, does the introduction of a design thinking approach to the curriculum of students of business studies improve their understanding of user needs in their decision making?
3. In your opinion, can empathy inform the decision-making process of business leaders?
4. In your opinion, does qualitative ethnographic research lead to a more empathic approach to innovation when compared to a quantitative data-driven approach to innovation?

5. In your opinion, is empathy valuable to you as a business leader when developing innovation solutions for end users?
6. In your opinion, could the use of qualitative design thinking in combination with quantitative data-driven design lead to more meaningful innovative solutions for users?

Part E

The following are thematic questions around teaching and language, as per the research.

1. Does teaching design thinking have value in business schools?
2. What is needed to effectively teach design thinking to business students?
3. Is it important to understand and speak the language of design in business?

Student Interview Keyword Frequency Findings

In order to measure the interview content frequency, coding categories were identified by the researcher and reviewed and verified by a neutral peer academic member. The final codes were then utilised by a neutral party, not the researcher, within the software, QDA Miner. QDA Miner is qualitative data analysis software that measures the frequency of data codes with the data set. This informed the next level of coding and thematic identification. The 'value of an empathic approach' had the highest number of statistical frequency counts and percentage of codes identified in the interviews. The QDA Miner raw outputs can be found in Appendix M.

Table 40 and Table 41 illustrate student interview coding and interview content frequency.

Table 40. Student Interview Coding

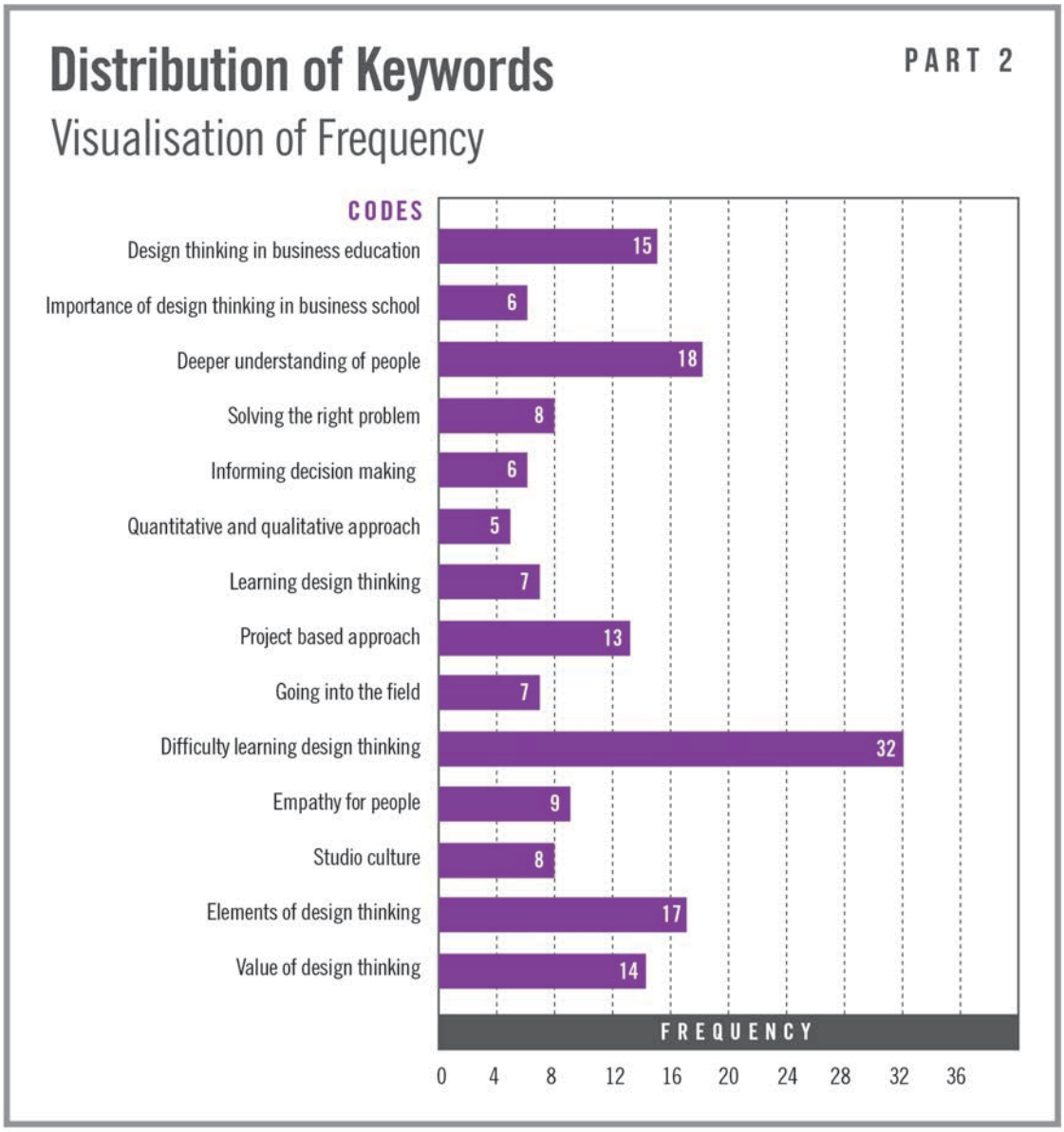
Student Interview Coding

PART 1

Specifics

CATEGORY	CODE	COUNT	% OF CODES	NUMBER OF CASES	% OF CASES
Identifying needs	Identifying user needs	24	4.20%	15	55.60%
Quality	Of better quality	21	3.60%	12	44.40%
Decision making	Business decision making	58	10.10%	18	66.70%
Empathy	More empathic approach	99	17.20%	24	88.90%
Meaningful	More meaningful solution	83	14.40%	23	85.20%
Value	Value of empathic approach	146	25.30%	24	88.90%
Language	Language of design	52	9.00%	20	74.10%
Leader	A better leader	22	3.80%	13	48.10%
User needs	Meeting user needs	19	3.30%	10	37.00%
Understanding	Improve the understanding of user needs	53	9.20%	22	81.50%

Table 41. Distribution of Keywords



4.5 Summary Analyses

The following statements are summary analyses from the above, which includes both surveys and interviews, with a view to clarifying the thematic findings that may become part of the specification for a new curriculum.

4.5.1 Theme 1: The Importance of Design Thinking in Modern Business School Education

- A critical skill that the business world is looking for is the ability to drive innovation and to be creative, and in order to be innovative, execution and creative skills are fundamental. Most business students coming into business school have little to no experience with creativity and design thinking.
- Empathy, which business students are very uncomfortable using, is fundamental to design thinking and can help connect people and organisations to problems that matter.
- Design thinking is an approach that supports business students in navigating uncertainty and ill-defined problems.

4.5.2 Theme 2: Design Thinking and the Business Curriculum

- The qualitative discovery approach associated with design thinking is complementary to the quantitative execution approach often found in business curriculums. The combination of both proved to be valuable to business students based on their classroom experiences.
- Design thinking needs to be coupled with business thinking in order to see value from the student's perspective and to realise value from the business organisation perspective.

4.5.3 Theme 3: Design Thinking Pedagogy

- Design thinking is not simply an intellectual exercise, and as such, it must be taught in a fundamentally different way than business school content is delivered to and absorbed by students.

- Design thinking is action-oriented and is best taught and learned through a lived experience that is project-based, which may prove to be uncomfortable to some business students.

4.5.4 Theme 4: Critical Elements of the Design Thinking Process

- Business students who use design thinking will be able to understand people more deeply through qualitative ethnographic fieldwork, which will help inform and frame meaningful opportunities or problems that people actually care about.
- Business students are able to learn the tactical elements of design thinking through an immersive, hands-on experience.
- A culture of critique, which is fundamental to design thinking and often foreign in the business school, enables business students to shape better ideas in a truly collaborative and open way, which is predicated on iteration.

4.5.5 Theme 5: Learning Through Contextual Experience

- Learning design thinking through a real project that has business context gives business students conviction that it is valuable, and it also allows them to see and experience first-hand how they can utilise and directly apply design thinking beyond an intellectual exercise.
- Business students are both curious and sceptical of design thinking; however, engaging students through hands-on applications builds both understanding and confidence in the subject as well as their ability to apply design thinking beyond the classroom.

4.5.6 Theme 6: Studio Culture

- A studio culture, which is critical to design thinking and creative problem-solving, is not central to traditional business education.
- A studio setting invites more open collaboration, experimentation, and making than a formal classroom setting, which is intended for the giving and receiving of lectures and cases.
- Business students found that a studio experience is valuable to learning design thinking.

4.5.7 Theme 7: The Value of Design Thinking to Business Students

- Design thinking provides value to business students by enabling them to view the world through a different way of understanding, rooted in deep empathy, and allowing them to discard inappropriate assumptions.
- A design thinking approach enables business students to get closer to the true needs of the user/customer, further enabling them to identify the right problem to solve.
- A design thinking approach enables business students to address complex needs through collaborative, hands-on, creative skills, that, when balanced with a business approach, can become a marketplace and leadership differentiator. The combination of both a business approach and a design thinking approach enables them to see and lead more holistically.
- Business students who have a design thinking skill set see it as a competitive advantage over business students who do not have the skill set.

4.5.8 Theme 8: Difficulties Business Students Have in Learning Design Thinking

- Business students are generally practical thinkers and often have difficulty seeing how to put a design thinking approach into practice, which can lead to further scepticism and a prioritisation of business skills over design thinking skills.
- Business students are uncomfortable with ambiguity and empathy, which complicates their willingness to explore, often leading them to default to quantitative approaches that quickly lead to shallow solutions.
- Business students generally do not have a creative background, and often the tactical skills associated with design thinking do not come naturally and can be difficult to learn.

4.5.9 Theme 9: The Complexity of Seeing Value in Design Thinking for Business Students

- For business students, design thinking can often be seen as not serious or rigorous because it looks and feels so very different from business school content, which leads many to be unwilling to immerse themselves in the process. However, for business students who have learned the subject through an immersive project-based experience, they find design thinking valuable.
- The hard work of design thinking takes time and patience, as the rigour and results come through the experiences in the actual journey, which may not be comfortable or acceptable to all business students.

CHAPTER 5

Conclusions

Chapter 5: Conclusions

5.1 Introduction

The aim of this research was to understand the background and opportunity that a design thinking approach might have with business students in a business school context with the objective of answering the following thesis question: 'Do business students value design thinking and if so, how might they learn it?'

The research findings identified nine themes that pertain to the above questions, which detail the conflicts and opportunities business students have in learning design thinking in a business school context. Furthermore, this chapter addresses each theme through a detailed description of the contribution of knowledge brought forth through the research, which defines a core curriculum and support tool that enables business students to both value and learn design thinking. The chapter continues by reflecting on the outcomes of business students who have used a design thinking approach taught to them through the course Research-Design-Build (RDB). This chapter concludes by recognizing the limitations of the research and suggesting future work that could be completed by others.

5.2 Themes

The following is a summary of the main themes:

5.2.1 Theme 1: The Importance of Design Thinking in Modern Business School Education

- By utilizing a combination of design thinking and business approaches to identify and solve problems, business students can become more holistic leaders. Through the utilisation of a design thinking approach, business students gain a

deeper empathy for people that they may not otherwise have gained through the utilisation of only a quantitative business approach.

5.2.2 Theme 2: Design Thinking and the Business Curriculum

- A design thinking approach needs to be delivered and learned differently than a business approach, and yet, to resonate with business students, design thinking needs to be facilitated to business constraints and tied directly to business outcomes.

5.2.3 Theme 3: Design Thinking Pedagogy

- Business students learn design thinking through an authentic hands-on experience.

5.2.4 Theme 4: Critical Elements of the Design Thinking Process

- Business students learn and value design thinking through a rigorous journey that they experience for themselves, developing design skills through repeated hands-on application, which ultimately become part of a unique toolkit for business students. This rigorous journey, first and foremost, enables them to understand people more deeply.

5.2.5 Theme 5: Learning Through Contextual Experience

- Business students authentically learn and value a design thinking approach when they see and experience its direct application.

5.2.6 Theme 6: Studio Culture

- Business students learn and value design thinking through a creative physical experience that stimulates collaboration and critique.

5.2.7 Theme 7: The Value and Competitive Advantage of Design Thinking to Business Students

- Business students value design thinking through the development of skills that readily enable them to actually understand and see users/customers more deeply through an empathy-based approach, which is unique to the business world. This approach enables business students to get closer to the true needs of the user/customer, further enabling them to identify the most appropriate problem to solve.

5.2.8 Theme 8: Difficulties Business Students Have in Learning Design Thinking

- Business students must reframe their mindsets to embrace tactical skills and learning approaches associated with design thinking in order to overcome difficulties in experiencing and actually learning empathy-based content that is not familiar to themselves and many of their business school peers.

5.2.9 Theme 9: The Complexity of Seeing Value in Design Thinking for Business Students

- As analytic thinkers with practical mindsets, business students need to experience design thinking first-hand in order to clearly understand its value to them in the context of business. They cannot be told or sold on the notion that it is important, that it’s rigorous, that it’s difficult, and that it’s of meaningful value to them as business student and, ultimately, future business leaders.

5.3 Connections to Literature

As Chapter 2: Literature Review outlines, three categories of literature were explored, with specific topics in each. The findings from the literature shaped the direction of the primary research and were mapped directly to areas of opportunity and themes, including specific supporting content within each theme. A detailed mapping of literature to opportunities and to themes, which emerged from the research, can be found in Appendix S.

The following literature connects to the themes that emerged from the findings below.

5.3.1 Designerly Ways: What Designers Do

Design in Innovation

Ruggles (2002), Rusk (2003), and Walton (1995) have found that design can be seen as a catalyst for innovation. This connects directly to Theme 1, which identifies a critical skill that the business world is looking for—the ability to drive innovation and to be creative. In order to be innovative, execution and creative skills are fundamental. Most business students entering business schools have little to no experience with creativity and design thinking.

The Role of Empathy in Design Thinking

According to Kouprie and Sleeswijk Vissor (2009), Pine and Gilmore (1999), Szasz (2016), and Starkey and Tempest (2009), empathy, which is a quality of the design thinking process, helps to frame new knowledge of people, which is fundamental to

solving problems in the service of innovation. Furthermore, empathy may improve the likelihood of making decisions that will have long-term positive outcomes for people. As such, an empathic framework can inform creative possibilities and facilitate richer decision spaces. This connects directly to Theme 1, which identifies that business students are uncomfortable with empathy, which is fundamental to design thinking and can help connect people and organisations to problems that matter.

Design Thinking and Strategy

Moss Kanter (1997 cited in Rusk 2016) and Rusk (2016) agree that in a world that is unpredictable and complex, more collaborative approaches are needed that inform strategies that address both current and future needs. This connects directly to Theme 7, which identifies a design thinking approach as enabling business students to address complex needs through collaborative, hands-on creative skills, and, when balanced with a business approach, can become a marketplace and leadership differentiator. The combination of both a business approach and a design thinking approach enables business students to see and lead more holistically.

5.3.2 Design and Business: Context and Learning

The Business Gap for Design

The business world often sees design as irrational (Burnette 2016 and Dorst 2015). This connects directly to Theme 5, which identifies that business students are both curious and sceptical of design thinking; however, engaging students through hands-on applications builds both understanding and confidence in the subject as well as their ability to apply design thinking beyond the classroom.

5.3.3 Design and the Business School

Liedtka and Ogilvie (2011) and Rusk (2016) posit that design skills such as empathy, problem framing and reframing, human-centred storytelling, and visualisation are elusive for business students. This connects directly to Theme 7, which identifies business students as being able to learn the tactical elements of design thinking only through an immersive, hands-on experience.

Design Thinking and Business Thinking

Burnette (2016) and Martin (cited in Dunne and Martin 2006) have shown that business thinking is guided by what is familiar, predictable, productive, and rewarding in the short term. It is reliability based. This connects directly to Theme 7, which identifies design thinking as providing value to business students by enabling them to observe the world differently through a lens of understanding that is rooted in empathy, thus allowing them to discard inappropriate assumptions.

Design-Based Learning for Business

Hollern (2016) and Teixeira (2009) state that design thinking in business education cannot be a product of discourse. This connects directly to Theme 5, which identifies learning design thinking through a real project that includes a business context, giving business students the conviction that it is valuable. This also allows them to see and experience first-hand how they could utilise and directly apply design thinking beyond an intellectual exercise.

Design can influence perception, which in turn can influence customer satisfaction (Fraser 2011 and Liedtka and Ogilvie 2011). This connects directly to Theme 1, which identifies that business students are uncomfortable with empathy, which is fundamental to design thinking and can help connect people and organisations to problems that matter.

Lawson (2006), Smith Taylor (2009), and Zidulka (2016) maintain that the studio environment—which is a community of practice that enables individuals to come together and creatively explore, develop, and debate new ideas—is totally different from the business school learning environment. This connects directly to Theme 6, which identifies a studio culture as critical to design thinking and creative problem-solving and is not central to traditional business education.

Business School Context and Curriculum

Clarke and Primo (2012) and van Aken (2001) have demonstrated that business schools historically have been guided by strict rules of engagement, are rigorously focused, and are linear in process—all supporting a scientific approach. This directly connects to Theme 7, which identifies a design thinking approach as enabling business students to get closer to the true needs of the user/customer, further supporting them to identify the most appropriate problem to solve.

Datar, Garvin, and Cullen (2010) and Mintzberg (2009) observed that experiential learning through project-based experiences is not commonplace in business schools. This connects directly to Theme 5, which identifies learning design thinking through a real project which has business context, giving business students the conviction that it is valuable. This also allows them to see and experience first-hand how they could utilise and directly apply design thinking beyond an intellectual exercise.

Also according to Datar, Garvin, and Cullen (2010), integration skills such as thoughtfully considering issues from diverse points of view, shifting angles, and framing are often lacking in business schools. This connects directly to Theme 4, which identifies business students who use design thinking will be able to understand people more deeply through qualitative ethnographic fieldwork, which will help inform and frame meaningful opportunities or problems that people actually care about.

5.4 Overview

The word design has often been associated with the artful creation and development of tangible products. However, today, with the rapid development of technologies—coupled with societal, economic, and environmental complexities—design has the opportunity to play a significant role in problem-solving, rather than simply product beautification and development. Within the context of problem-solving, it is the interdisciplinary and method-based design thinking approach which offers an

opportunity to integrate with business in the service of a more holistic approach to innovation.

While business and design share certain traits, their differences are most profound in the way each practises the methodologies aligned with the processes within the given domain. Thus, the domain of design thinking needs to be cautious when it overemphasises the notion of being and/or thinking differently in order to distinguish itself from business practices. Design thinking needs to cautiously steer clear of novelty and those that practise it need to appreciate the diversity of skill sets and perspectives that are actually critical to making design thinking effective. The research directly points to the success of design thinking in the context of business as a highly integrated model.

Business and design thinking need each other in order to be successful, and building a credible platform for integrating, exploring, and learning is fundamental for the growth of this holistic approach. As such, those new opportunities begin with an integrated, design-minded education platform for business students in order to facilitate learning and practice as well as build confidence in design thinking as they apply it directly to the in-context creation of new business value.

As a design educator and practitioner, the researcher has spent 25 years in the innovation space, utilizing a design thinking approach. It is with this perspective that the researcher designed and developed a prototype design thinking course, entitled Research-Design-Build (RDB), for business students at Northwestern University. This

prototype was developed as a dynamic, hands-on experience for business students, and the course was structured as a ‘studio’ practicum course, which is completely different from the teaching and learning platforms within most business schools. The business students who participated in this course were the basis of this research.

Previously, the researcher had attempted to teach design thinking content to business students in a framework that they would be familiar with, i.e., the case study method, specific readings, and traditional lecture-based delivery of content via PowerPoint. While this method of teaching proved to be familiar to business students, they struggled to see the value of a design thinking approach, mindset, and toolkit, because they had not actually lived and practised it in a non-theoretical or practical way. Design thinking for many of these business students remained fuzzy, non-rigorous, and lacked a clear strategic benefit and value to them as future business leaders.

5.5 Answering the Question

The thesis question ‘Do business students value design thinking and if so, how might they learn it? is answered through the triangulation of literature and surveys and interviews with both academics and students, resulting in specific and actionable insights.

In answering the thesis question, the researcher concludes that to find value in design thinking, students need to learn and practise it first-hand in a non-traditional business school educational format, which would be focused totally on experiential, project-based learning. This new format would actively put business students front and centre in

the design process. They would identify a space for innovation, glean deep insights from actual users, frame and reframe the problem, ideate solutions, prototype concepts, test theories, and iterate at every phase of the process. Students would also do this in the context of a real business challenge and directly apply design thinking to the identification and development of a business model, which would directly connect to the business and inform business outcomes. They would no longer learn through the traditional business school methodologies of content delivery. They would learn by doing, which is arguably the only way to effectively understand, activate, and realise the real value of design thinking.

In this way, business students can learn and value design thinking authentically while directly connecting it to business outcomes.

5.6 Contribution to Knowledge

Given the background, qualifications and worldview of the student participants in this study, their perceived learning fills several gaps identified in the literature (see Appendix S—Literature Review Mapping to Opportunities and Themes), the researcher's informal observations (see 5.10 Postscript 2—A Story of Success), and surveys and commentary by student participants and expert academics associated with this area of business (see 4.2.1 – 4.2.9).

Business students in the business school learn design thinking and realise the value first-hand through practice rather than through theory. This is done by engaging in a structured, immersive experience through a contextual project that is directly framed by

a business context and related constraints. This experience is realised through a structured curriculum that guides and enables the students to learn through repeated hands-on experiences, which challenges them to discover, frame, create, and deliver a unique, innovative business outcome that meets or exceeds user/customer desirability and business feasibility and viability. The term ‘deeper empathy’ is defined in this context as empathy that is gained through a robust, immersive experience.

5.6.1 Specific Claims

1. Learning is facilitated through a studio-based experience, which enables and promotes creativity, public sharing of ideas, collaboration, iteration, and critique.

   Claim informed by:

   - Theme 3: Design Thinking Pedagogy
   - 4.5.6 Theme 6: Studio Culture
   - 4.3.2 Survey 2: Table 19-21
   - 4.3.3 Survey 3: Table 24-25
   - 4.3.4 Survey 4: Table 32

2. Design-thinking tactics are learned through repeated hands-on application in authentic experience-based immersions. This extensive practice of tactics includes field research in order to gain deeper empathy and aid in problem identification, problem-framing, concept generation, prototyping, and iteration.

   Claim informed by:

   - 4.5.3 Theme 3: Design Thinking Pedagogy
   - 4.5.4 Theme 4: Critical Elements of the Design Thinking Process
   - 4.5.5 Theme 5: Learning Through Contextual Experience

- 4.3.3 Survey 3: Table 24-26
- 4.3.4 Survey 4: Table 27-32

3. Deeper empathy is gained through a rigorous process that repeatedly puts the student in contextual, immersive experiences.

   Claim informed by:

   - 4.5.4 Theme 4: Critical Elements of the Design Thinking Process
   - 4.5.5 Theme 5: Learning Through Contextual Experience
   - 4.5.7 Theme 7: The Value of Design Thinking to Business Students
   - 4.5.8 Theme 8: Difficulties Business Students Have in Learning Design Thinking
   - 4.3.1 Survey 1: Table 17
   - 4.3.2 Survey 2: Table 22
   - 4.3.4 Survey 4: Table 27-28

4. Design thinking is a project-based approach to learning that utilises business context and constraints, enables business students to connect design-thinking learning directly to a business application. It is not learned in isolation nor as theory.

   Claim informed by:

   - 4.5.3 Theme 3: Design Thinking Pedagogy
   - 4.5.4 Theme 4: Critical Elements of the Design Thinking Process
   - 4.5.5 Theme 5: Learning through Contextual Experience
   - 4.3.2 Survey 2: Table 23
   - 4.3.2 Survey 4: Table 27-32

5. Design-thinking outputs are integrated and further developed through a business model canvas, which integrates user desirability (deeper empathy) with business feasibility and viability, ultimately shaping innovative business outcomes.

   Claim informed by:

   - 4.5.1 Theme 1: The Importance of Design Thinking in the Modern Business School Education
   - 4.5.2 Theme 2: Design Thinking and the Business Curriculum
   - 4.5.7 Theme 7: The Value of Design Thinking to Business Students
   - 4.5.8 Theme 8: Difficulties Business Students Have in Learning Design Thinking
   - 4.5.9 Theme 9: The Complexity of Seeing the Value in Design Thinking for Business Students
   - 4.3.2 Survey 2: Table 23
   - 4.3.5 Survey 5: Table 33-34

The new knowledge brought forth to this subject should allow for business schools to teach a design-thinking approach that resonates with a business audience, while also enabling business students to authentically experience, learn, and value design thinking as an approach to solving problems which can inform business outcomes.

By doing so, business students and business schools can see and experience the rigour, application, and value of design thinking in business.

5.7 Limitations of the Research

The researcher conducted the study qualitatively as a constructivist, rooted in interpretivism, seeing the world as subjective and socially constructed. As such, the study does not contain data that is statistically significant from the point of view of science. All forms of data gathered, through a mixed methods approach, is in support of further understanding the context of the research question.

The literature review showed that there was limited prior work of this nature in this specific area of research. Also, writings dedicated to the specific subject mostly focused on design thinking in the service of product design and development.

Additionally, the current research was conducted only in the United States. Northwestern University served as the primary laboratory for student surveys, interviews, and curriculum testing, and peer academic members at top-rated business school institutions in the United States would be surveyed and interviewed. The research is, therefore, located firmly in the academic business culture of the United States. It also follows that the range of participants was limited to cohorts of one course (Research Design Build), and the context of those participants self-selecting to enroll on that course.

The study has been conducted in a rigorous manner within the above constraints. However, it should be viewed as a basis for continued research, which may lead to greater insights.

5.8 Future Work

While the primary research is restricted to business schools in the United States, with Northwestern University as the principal laboratory, future research and testing of the proposed curriculum and tools could be extended in the future to international institutions. The international work may uncover cultural differences.

It is also recognised that the proposed curriculum for this area of education may have other applications, such as in highly analytical statistical fields like engineering.

The findings will be initially shared with business school educational leaders at Northwestern University and elsewhere in the United States through direct application, journal publications, and conference presentations.

5.9 Postscript 1—Demonstrator Curriculum

A curriculum was designed following on from the new knowledge, and it is offered as one manifestation of such a curriculum. This curriculum is untested, but it may offer a scaffold for other institutions to develop their own versions, taking into account local and specific requirements.

The curriculum utilises a project-based approach to learning and has a real-world business challenge as the central core, which runs throughout the entirety of the course. Business students learn through the application and repeated practice of concepts, tools, and methodologies in a real-time format. This deep immersion allows the students to

gain real empathy and enables them to understand the context of the challenge first-hand.

Within the demonstrator curriculum, a ‘Concept Rationale Worksheet’ is utilised, providing a framework for business students to capture an idea and build out a preliminary narrative, enabling the student to further shape the solution from a business perspective. This would be used later in the concept development process, once initial ideas are further developed.

The worksheet enables the capture of the idea and supporting narrative on one sheet, allowing for the student to see a more holistic idea that they can further iterate or walk away from based on the challenge criteria, payoff, and innovation level.

The demonstrator curriculum and ‘Concept Rationale Worksheet’ can be found in Appendix T and Appendix U.

5.10 Postscript 2—A Story of Student Success

Finally, the researcher was delighted that his students performed well against their business school peers in a competition.

5.10.1 Overview

The following details a business school challenge in which students who had completed the class Research-Design-Build (RDB) significantly outperformed students who had not taken the class and who did not utilise a design thinking approach or design thinking

tools while competing in the challenge. The challenge is open to all business students at the Kellogg School of Management at Northwestern University.

The Kellogg Business Innovation Challenge is a multi-week challenge in which the corporate partner presents a challenge, which is focused on understanding, developing, and scaling a strategic business innovation that is critical to their specific business. The challenge partner also judges the participants, selecting the top five teams in rank order. The challenge is managed by the Kellogg Innovation Club, which is a student-operated club and is strictly an extra-curricular event.

Students self-form into teams (the student pool consisted of 490 students on average, 60 of which had taken the design thinking course, Research-Design-Build (RDB), prior to each challenge).

Table 42. Kellogg Business Innovation Challenge: Four Year Overview

Kellogg Business Innovation Challenge

Four Year Overview – Participants

YEAR	CHALLENGE PARTNER	TOTAL TEAMS WITHOUT RDB EXPERIENCE	TOTAL TEAMS WITH RDB EXPERIENCE	AVERAGE TEAM SIZE
2014	McDonald's	21	4	5
2015	3M	26	5	5
2016	AstraZeneca	31	6	5
2017	P&G	30	5	5

Outcomes

Over the course of four years and four different challenges, student teams that were entirely made up of or were disproportionally made up of students who had already taken the design thinking course, Research-Design-Build (RDB), dominated the challenges by understanding, developing, and scaling more innovative solutions than their peer business school students who had not taken Research-Design-Build (RDB).

Outcome feedback was collected through end-of-challenge feedback loops and interviews with sponsors and students as part of follow-up marketing promotional material.

Table 43. Kellogg Business Innovation Challenge—Placement Results

Kellogg Business Innovation Challenge

Four Year Overview – Placement Results

YEAR	CHALLENGE PARTNER	1ST PLACE	2ND PLACE	3RD PLACE	4TH PLACE	5TH PLACE
2014	McDonald's	RDB	RDB		RDB	RDB
2015	3M	RDB		RDB	RDB	
2016	AstraZeneca	RDB	RDB	RDB		
2017	P&G	RDB	RDB		RDB	

McDonald's Winning Team Feedback

> 'The human-centered approach won the day. We were excited to see business students really understand our guests.'
>
> 'The prototype went a long way to explain the idea and its value.'

—McDonald’s Director of Sustainability

‘It’s exciting to see the level of detail you brought to your approach. From understanding the customer to creating a business model that makes sense for us. This was a very well-rounded solution.’

—McDonald’s Associate Marketing Manager

3M Winning Team Feedback

‘The storytelling skills were superb, and I loved the way they brought the users struggles into the narrative. The solution directly answered those struggles and it had real believability.’

‘I’m excited to share your fresh thinking with my team.’

—3M Product Manager

‘Your work and the solution feels like it came from a design group and not a group of MBAs. I’m both surprised and excited about where you took this problem.’

—3M Senior Industrial Designer

AstraZeneca Winning Team Feedback

‘The team showed incredible creativity with their solution. We would have had a hard time coming up with a similar idea and we are working at this every day.’

—AstraZeneca Marketing Director

‘I never expected a storyboard. It totally brought your concept to life…did you really draw that?’

—AstraZeneca Product Manager

‘You understood our customers and told their story in a way that we don’t.’

—AstraZeneca Product Manager

P&G Winning Team Feedback

‘The design thinking process fueled an environment where we trusted each other and our research, a natural curiosity and willingness to be open to the unexpected, and, at the end of the day, a compelling story around a surprising yet relatable challenge topic.’

—RDB student from winning team

‘Research-Design-Build equipped us with the right mindset, research frameworks, and creative confidence to go out and ask random strangers about what is usually a sensitive topic.’

‘It seems so intuitive looking at the final result now, but behind these insights are dozens of interviews, prototypes, and crumpled Post-it notes.’

—RDB student from winning team

‘A user-centered design approach is fundamental to innovation because it uncovers insights not based on what people say they do, but what they actually do. Being user-centered means getting as close to the user as possible to create something that the world never knew it needed, but now can’t live without.’

—RDB student from winning team

‘It’s great to see business students immerse themselves in the tools and methods to be a champion for the user while tackling real-world challenges. Putting people first is key to providing breakthrough solutions to sticky business problems.’

‘What was exciting to see was the fact that these students actually prototyped their ideas.’

—P&G Product Manager

‘Clearly there was another level of innovation done here.’

‘Having just seen this inspiring work, I wish I was back in school. The level of depth is something that I never did in business school.’

—P&G Marketing Manager

In learning through a hands-on, immersive curriculum and utilizing the content developed and iterated in Research-Design-Build (RDB), *business students and business organisations* found value in a design thinking approach taught at a business school for business students.

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A

List of Appendices

Appendix A

Certificate of Ethical Approval—Coventry University

Certificate of Ethical Approval

Applicant:

Greg Holderfield

Project Title:

Empathic Design and Business Decision Making

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Low Risk

Date of approval:

24 March 2016

Project Reference Number:

P26519

Appendix B

Ethical Approval

Appendix C

Definitions and Terms

- **Analytics** is the discovery, interpretation, and communication of patterns in data, which are meaningful, through the use of mathematics, statistics, and predictive modeling.

- C**reativity** is the ability to perceive something in new and imaginative ways through thinking and then producing something original.

- **Quantitative Data** is data that defines, in the form of a statistical measure of values or counts, expressed as numbers.

- **Qualitative Data** is data that describes, in a form which approximates or characterizes but does not measure the attributes, characteristics, or properties of a phenomenon or thing.

- **Empathy** is the ability to understand another person from their perspective. This is done by placing oneself in the shoes of another and feeling what they are experiencing. It involves developing an understanding of both a persons' emotional and rational needs and wants, which creates a heightened sensitivity to the audience.

- **Empathic methods** refers to the qualitative research methods used to uncover and understand the latent needs of a user/customer. These methods are observational in nature and are conducted in context.

- **Empathic Design** is a user centred approach to opportunity finding that emphasizes human understanding and interaction with objects, experiences and systems. The term is interchangeable with 'Design Thinking'. This term is

primarily used in academic settings and literature.

- **Innovation** is the creation and application of a viable new offering/solution that meets new requirements, unarticulated needs, or existing market needs.

- An **Innovation Process** is a systemic approach to problem solving that contains methods, which enable the development of new ideas and opportunities.

- **Design Innovation** is the creation of a new viable offering/solution framed through a human centered lens and developed using traditional design tactics.

- **Design Thinking** is a methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human behavior.

- **Solution Based Innovation** aims to develop and prototype a wide range of concepts and iterate on those concepts based on user feedback. It is not problem focused but rather opportunity focused.

- **Ethnographic Research** is an anthropology based research approach used in the field of social science to study people and cultures in context.
  It seeks to collect deep insights on people and the rationale behind their behavior. Additionally, smaller sample sizes are utilised.

- **Course(s)** are individual subjects taught. Can be used interchangeably with "subject."

- **Core Courses** are required subjects taught.

- **Design-Centric** represents a general sensitivity to design, design thinking and actions associated with designerly ways of knowing and doing.

- **Innovation Centric** represents a way of knowing and doing, all in the service of bringing about innovation.

- **Design Innovation Centric** represents a way of knowing and doing, using a design mindset and toolkit, all in the service of bringing about innovation.

- The **Design Management Institute** (DMI) is an organization that connects design to business.

- A **Contextual Interview** is it interviewing technique that is one-on-one between the interviewee in the interviewer.

- **Comparative Studies** refers to research devoted to specific types of subjects, across different domains, with an aim to make comparisons.

- **Excellence** refers to having achieved a high level within an area.

- **Interpretivism**, also know as antipositivism, refers to the belief in social science.

- **NU** refers to Northwestern University

- **MBA** refers to a Master in Business Administration

- **RDB** refers to the design thinking course, Research-Design-Build.

- **Purposive Sampling** refers to the selection of research subjects based on

existing knowledge of a particular group.

- A **Purposive Sample** is a non-probability research sample, which is selected based on defined characteristics of existing knowledge of defined group.

- The **Quarter System** divides the academic year into summer, fall, winter, spring. The typical quarter lasts 10 weeks.

- The **Semester System** divides the academic year into 2 parts, fall and spring. The typical semester lasts 15 weeks.

- **Triangulation Research** refers research conducted by two (or more) methods are used in a study in order to check the results of one and the same subject.

- **Human Centered** is an approach to solving problems that starts with the people you are trying to solve for and ends with solutions that meet their needs.

- **Collaboration is t**he act of working with someone to produce or create something.

- **Critique** is a method for feedback which can be both critical and constructive.

- **Project Base Experience** is a dynamic teaching approach that enables students to gain a deeper knowledge through active exploration of real-world challenges and problems.

- **Framing the problem** is a process for narrowing and pinpointing the right problem to solve through evidence and constraints.

- **Visualizing ideas** is a tangible way of developing, building and conveying ideas

in a visual way.

- **Storyboarding** is a graphically visual way to display a sequence of events. Often used to visualize a user journey, product idea or service experience.

- **Prototyping** is a way to bring an early stage idea to life through the act of building out the concept in order to test and learn from it.

- **Iteration** is the act of learning and evolving ideas.

- **Studio Culture** is a dynamic and flexible mindset and physical environment that is creative, which promotes the development of highly visible content for collaborative engagement and the creation of new ideas.

Appendix D

Survey 1

Academic Research Survey – Pre-Research-Design-Build

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

IRB study number: STU201508

Participation:

I'm asking for your participation in this research study because you are a business student at the Kellogg School of Management - Northwestern University, who is enrolled but has not yet taken the design thinking course, Research-Design-Build (RDB).

I seek to understand, in your opinion and based on your work experience before business school and prior to taking the design thinking class, how you respond to the following statements regarding analytics and creativity, quantitative and qualitative data, empathy, and design thinking

Implications:

- This survey is completely voluntary.
- You will be anonymous.
- There is no right or wrong answer.
- This survey has no implications on your academic standing at Northwestern University.
- By completing this survey, you will have agreed to participate.

Definition of terms used in survey:

- Provided as part of survey for reference.

Logistics:

- This online survey will be administrated by an independent entity.
- Please submit electronically.

Definition of terms used in survey:

Analytics: The discovery, interpretation, and communication of patterns in data, which are meaningful, through the use of mathematics, statistics, and predictive modeling.

Creativity: The ability to perceive something in new and imaginative ways through thinking and then producing something original.

Quantitative Data: Data that defines, in the form of a statistical measure of values or counts, expressed as numbers.

Qualitative Data: Data that describes, in a form which approximates or characterizes but does not measure the attributes, characteristics, or properties of a phenomenon or thing.

Empathy: The ability to understand another person from their perspective. This is done by placing oneself in the shoes of another and feeling what they are experiencing. It involves developing an understanding of both a persons' emotional and rational needs and wants, which creates a heightened sensitivity to the audience.

Design Thinking: A methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human behavior.

Survey 1: (Includes the numbers of students per response)

Part 1 – Analytics and Creativity

1. Prior to coming to business school my business skill set was analytical.

   - Strongly Agree (33 students)
   - Agree (135 students)
   - Neutral (14 students)
   - Disagree
   - Strongly Disagree

2. I am confident using analytical approaches to solve problems.

   - Strongly Agree (149 students)
   - Agree (20 students)
   - Neutral
   - Disagree (11 students)
   - Strongly Disagree

3. Prior to coming to business school my business skill set was creative.

   - Strongly Agree
   - Agree
   - Neutral
   - Disagree (58 students)
   - Strongly Disagree (122 students)

4. I am confident using creative approaches to solve problems.

   - Strongly Agree
   - Agree
   - Neutral
   - Disagree (47 students)
   - Strongly Disagree (133 students)

5. Prior to coming to business school my business skill set was both analytical and creative.

   - Strongly Agree
   - Agree
   - Neutral
   - Disagree (156 students)

- Strongly Disagree (34 students)

6. I am confident using both analytical approaches and creative approaches to solve problems.

   - Strongly Agree
   - Agree
   - Neutral
   - Disagree (160 students)
   - Strongly Disagree (20 students)

7. Analytics is valuable in the business world.

   - Strongly Agree (167 students)
   - Agree (13 students)
   - Neutral
   - Disagree
   - Strongly Disagree

8. Creativity is valuable in the business world.

   - Strongly Agree
   - Agree (36 students)
   - Neutral (68 students)
   - Disagree (76 students)
   - Strongly Disagree

9. Analytics is more valuable than creativity in the business world.

   - Strongly Agree (14 students)
   - Agree (152 students)
   - Neutral (14 students)
   - Disagree
   - Strongly Disagree

10. Creativity is more valuable than analytics in the business world.

    - Strongly Agree
    - Agree
    - Neutral (14 students)
    - Disagree (6 students)
    - Strongly Disagree (160 students)

11. Analytics and creativity are equally valuable in the business world.

    - Strongly Agree
    - Agree (25 students)
    - Neutral (14 students)

- Disagree (40 students)
- Strongly Disagree (101 students)

Part 2 – Quantitative and Qualitative

1. Prior to coming to business school I used quantitative data to inform decisions regarding users/customers in my work practice.

   - Strongly Agree (16 students)
   - Agree (164 students)
   - Neutral
   - Disagree
   - Strongly Disagree

2. Prior to coming to business school I used qualitative data to inform decisions regarding users/customers in my work practice.

   - Strongly Agree
   - Agree (11 students)
   - Neutral
   - Disagree (38 students)
   - Strongly Disagree (131 students)

3. Prior to coming to business school I used a combination of both quantitative and qualitative data to inform decisions regarding users/customers in my work practice.

   - Strongly Agree
   - Agree (11 students)
   - Neutral
   - Disagree (41 students)
   - Strongly Disagree (128 students)

4. Quantitative data regarding users/customers is valuable in the business world.

   - Strongly Agree (133 students)
   - Agree (47 students)
   - Neutral
   - Disagree
   - Strongly Disagree

5. Qualitative data regarding users/customers is valuable in the business world.

   - Strongly Agree
   - Agree (76 students)

- Neutral (86 students0
- Disagree (18 students)
- Strongly Disagree

6. Quantitative data regarding users/customers is more valuable than qualitative data regarding users/customers in the business world.

   - Strongly Agree (11 students)
   - Agree (128 students)
   - Neutral (14 students)
   - Disagree (27 students)
   - Strongly Disagree

7. Qualitative data regarding users/customers is more valuable than quantitative data regarding users/customers in the business world.

   - Strongly Agree
   - Agree (31 students)
   - Neutral (14 students)
   - Disagree (122 students)
   - Strongly Disagree (13 students)

8. Quantitative and qualitative data regarding users/customers are equally important in the business world.

   - Strongly Agree
   - Agree (32 students)
   - Neutral (40 students)
   - Disagree (99 students)
   - Strongly Disagree (9 students)

Part 3 - Empathy

1. Prior to coming to business school, empathy informed my decisions regarding users/customers in my work practice.

   - Strongly Agree
   - Agree (11 students)
   - Neutral (6 students)
   - Disagree (125 students)
   - Strongly Disagree (38 students)

2. Empathy was important in understanding users/customers in my work practice.

   - Strongly Agree

- Agree (9 students)
- Neutral (43 students)
- Disagree (117 students)
- Strongly Disagree (11 students)

3. I am comfortable using empathy.

   - Strongly Agree
   - Agree (11 students)
   - Neutral (6 students)
   - Disagree (156 students)
   - Strongly Disagree (7 students)

4. Empathy is valuable in the business world.

   - Strongly Agree (33 students)
   - Agree (48 students)
   - Neutral (76 students)
   - Disagree (23 students)
   - Strongly Disagree

Part 4 – Design Thinking

1. Prior to coming to business school I used a design thinking approach to solve problems in my work practice.

   - Strongly Agree
   - Agree
   - Neutral
   - Disagree (31 students)
   - Strongly Disagree (149 students)

2. I am confident using a design thinking approach to solve problems.

   - Strongly Agree
   - Agree
   - Neutral
   - Disagree (11 students)
   - Strongly Disagree (169 students)

3. Design thinking is valuable in the business world.

   - Strongly Agree (9 students)
   - Agree (46 students)
   - Neutral (112 students)

- Disagree (13 students)
- Strongly Disagree

Appendix E

Survey 2

Academic Research Survey – Post Research-Design-Build

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

IRB study number: STU201508

Participation:

I'm asking for your participation in this research study because you are a business student at the Kellogg School of Management - Northwestern University, who has just completed the design thinking course, Research-Design-Build (RDB).

I seek to understand, in your opinion, your experience with a design thinking approach, the environment for learning, how we inform empathy and decisions through data, and the context for learning design thinking after having taken the first design thinking class.

Implications:

- This survey is completely voluntary.
- You will be anonymous.
- There is no right or wrong answer.
- This survey has no implications on your academic standing at Northwestern University.
- By completing this survey, you will have agreed to participate.

Definition of terms used in survey:

- Provided as part of survey for reference.

Logistics:

- This online survey will be administrated by an independent entity.
- Please submit electronically.

Definition of terms used in survey:

Quantitative Data: Data that defines, in the form of a statistical measure of values or counts, expressed as numbers.

Qualitative Data: Data that describes, in a form which approximates or characterizes but does not measure the attributes, characteristics, or properties of a phenomenon or thing.

Empathy: The ability to understand another person from their perspective. This is done by placing oneself in the shoes of another and feeling what they are experiencing. It involves developing an understanding of both a persons' emotional and rational needs and wants, which creates a heightened sensitivity to the audience.

Design Thinking: A methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human behavior.

Creativity: The ability to perceive something in new and imaginative ways through thinking and then producing something original.

Human Centered: An approach to solving problems that starts with the people you are trying to solve for and ends with solutions that meet their needs.

Collaboration: The act of working with someone to produce or create something.

Critique: A method for feedback which can be both critical and constructive.

Project Base Experience: A dynamic teaching approach that enables students to gain a deeper knowledge through active exploration of real-world challenges and problems.

Survey 2: (Includes the numbers of students per response)

Part 1 – Design Thinking Approach

1. A design thinking approach to problems is different than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (174 students0
   - Agree (6 students)
   - Neutral
   - Disagree
   - Strongly Disagree

2. A design thinking approach to problems is more exploratory than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (148 students)
   - Agree (25 students)
   - Neutral (7 students)
   - Disagree
   - Strongly Disagree

3. A design thinking approach to problems is more collaborative than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (155 students)
   - Agree (6 students)
   - Neutral (7 students)
   - Disagree (12 students)
   - Strongly Disagree

4. A design thinking approach to problems is more creative than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (157 students)
   - Agree (14 students)
   - Neutral
   - Disagree (9 students)
   - Strongly Disagree

5. A design thinking approach to problems is more visual than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (173 students)
   - Agree (7 students)

- Neutral
- Disagree
- Strongly Disagree

6. A design thinking approach to problems is more experimental than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (169 students)
   - Agree (11 students)
   - Neutral
   - Disagree
   - Strongly Disagree

7. A design thinking approach to problems is more human centered than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (167 students)
   - Agree
   - Neutral (13 students)
   - Disagree
   - Strongly Disagree

8. A design thinking approach to problems is more hands-on than a business approach to problems, based on my classroom experiences.

   - Strongly Agree (152 students)
   - Agree (28 students)
   - Neutral
   - Disagree
   - Strongly Disagree

Part 2 – Environment for Learning

1. The environment for learning design thinking is different than an environment for learning business skills, based on my classroom experiences.

   - Strongly Agree (180 students)
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

2. The environment for learning design thinking invites exploration, based on my classroom experiences.

- Strongly Agree (167 students)
- Agree (13 students)
- Neutral
- Disagree
- Strongly Disagree

3. The environment for learning business skills invites exploration, based on my classroom experiences.

   - Strongly Agree
   - Agree (14 students)
   - Neutral (11 students)
   - Disagree (133 students)
   - Strongly Disagree (22 students)

4. The environment for learning design thinking invites collaboration, based on my classroom experiences.

   - Strongly Agree (180 students)
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

5. The environment for learning business skills invites collaboration, based on my classroom experiences.

   - Strongly Agree
   - Agree (41 students)
   - Neutral (33 students)
   - Disagree (106 students)
   - Strongly Disagree

6. The environment for learning design thinking invites creativity, based on my classroom experiences.

   - Strongly Agree (180 students)
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

7. The environment for learning business skills invites creativity, based on my classroom experiences.

   - Strongly Agree

- Agree (11 students)
- Neutral (16 students)
- Disagree (135 students)
- Strongly Disagree (18 students)

8. The environment for learning design thinking invites experimentation, based on my classroom experiences.

   - Strongly Agree (164 students)
   - Agree (16 students)
   - Neutral
   - Disagree
   - Strongly Disagree

9. The environment for learning business skills invites experimentation, based on my classroom experiences.

   - Strongly Agree
   - Agree
   - Neutral (18 students)
   - Disagree (153 students)
   - Strongly Disagree (9 students)

10. The environment for learning design thinking is invites critique, based on my classroom experiences.

    - Strongly Agree (162 students)
    - Agree (18 students)
    - Neutral
    - Disagree
    - Strongly Disagree

11. The environment for learning business skills invites critique, based on my classroom experiences.

    - Strongly Agree
    - Agree (36 students)
    - Neutral
    - Disagree (128 students)
    - Strongly Disagree (16 students)

12. The environment for learning design thinking is often outside the structured classroom, based on my classroom experiences.

    - Strongly Agree (138 students)
    - Agree (42 students)
    - Neutral
    - Disagree

- Strongly Disagree

13. The environment for learning business skills is often inside the structured classroom, based on my classroom experiences.

    - Strongly Agree (11 students)
    - Agree (146 students)
    - Neutral
    - Disagree (23 students)
    - Strongly Disagree

Part 3 - Informing Empathy and Decisions Through Data

1. Quantitative data lead me to empathy for the user/customer, which shaped my decisions on how to address the project challenge in class.

    - Strongly Agree
    - Agree
    - Neutral
    - Disagree (152 students)
    - Strongly Disagree (28 students)

2. Qualitative data lead me to empathy for the user/customer, which shaped my decisions on how to address the project challenge in class.

    - Strongly Agree (161 students)
    - Agree (19 students)
    - Neutral
    - Disagree
    - Strongly Disagree

3. Quantitative data proved to be the most valuable resource, when shaping my decisions on how to address the project challenge in class.

    - Strongly Agree
    - Agree
    - Neutral (17 students)
    - Disagree (141 students)
    - Strongly Disagree (22 students)

4. Qualitative data proved to be the most valuable resource, when shaping my decisions on how to address the project challenge in class.

   - Strongly Agree (13 students)
   - Agree (152 students)
   - Neutral (15 students)
   - Disagree
   - Strongly Disagree

5. A combination of both quantitative and qualitative data proved to be the most valuable resource, when shaping my decisions on how to address the project challenge in class.

   - Strongly Agree (39 students)
   - Agree (141 students)
   - Neutral
   - Disagree
   - Strongly Disagree

Part 4 – Context for Learning Design Thinking

1. Learning design thinking through a guided and structured process was effective in Research-Design-Build.

   - Strongly Agree (38 students)
   - Agree (142 students)
   - Neutral
   - Disagree
   - Strongly Disagree

2. Learning design thinking through a hands-on approach was effective in Research-Design-Build.

   - Strongly Agree (167 students)
   - Agree (13 students)
   - Neutral
   - Disagree
   - Strongly Disagree

3. Learning design thinking through a project-based experience was effective in Research-Design-Build.

   - Strongly Agree (164 students)
   - Agree (16 students)
   - Neutral
   - Disagree
   - Strongly Disagree

4. Learning design thinking through a real business challenge was effective in Research-Design-Build.

   - Strongly Agree (168 students)
   - Agree (12 students)
   - Neutral
   - Disagree
   - Strongly Disagree

Appendix F

Survey 3

Academic Research Survey – Learning to be a Design Thinker

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

IRB study number: STU201508

Participation:

I'm asking for your participation in this research study as a peer academic member, not at the Kellogg School of Management, who teaches innovation centric content at a business school within their respective university. Design thinking is part of what you teach.

I seek to understand, in your opinion and based on your academic experience,

what is important for students when learning to be a design thinker.

Implications:

- This survey is completely voluntary.
- You will be anonymous.
- There is no right or wrong answer.
- By completing this survey, you will have agreed to participate.

Logistics:

- This online survey will be administrated by an independent entity.
- Please submit electronically.

Survey 3: (Includes the numbers of academic members per response)

1. Case studies are best for learning to be a design thinker.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree (1 academic member)
   - Entirely Disagree (4 academic members)

2. Lectures are best for learning to be a design thinker.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (1 academic member)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree (3 academic members)
   - Entirely Disagree (1 academic member)

3. Readings are best for learning to be a design thinker.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (1 academic member)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree (3 academic members)
   - Entirely Disagree (1 academic member)

4. Project-based experiences are best for learning to be a design thinker.

   - Entirely Agree (5 academic members)
   - Mostly Agree
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

5. Integrating real business constraints and considerations are best for learning to be a design thinker.

   - Entirely Agree (1 academic member)
   - Mostly Agree (4 academic members)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

6. A lecture hall setting is best for learning to be a design thinker.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree (1 academic member)
   - Mostly Disagree
   - Entirely Disagree (4 academic members)

7. A studio-based experience is best for learning to be a design thinker.

   - Entirely Agree (4 academic members)
   - Mostly Agree (1 academic member)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

8. Open mindedness is best for learning to be a design thinker.

   - Entirely Agree (5 academic members)
   - Mostly Agree
   - Somewhat Agree
   - Neutral

- Somewhat Disagree
- Mostly Disagree
- Entirely Disagree

9. Hands-on activities are best for learning to be a design thinker.

   - Entirely Agree (4 academic members)
   - Mostly Agree (1 academic member)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

10. A culture of critique is best for learning to be a design thinker.

    - Entirely Agree (5 academic members)
    - Mostly Agree
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

11. A culture of collaboration is best for learning to be a design thinker.

    - Entirely Agree (5 academic members)
    - Mostly Agree
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

12. Small teams are best for learning to be a design thinker.

    - Entirely Agree (4 academic members)
    - Mostly Agree (1 academic member)
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

13. Teaching individually is best for learning to be a design thinker.

- o Entirely Agree
- o Mostly Agree
- o Somewhat Agree (1 academic member)
- o Neutral
- o Somewhat Disagree
- o Mostly Disagree (4 academic members)
- o Entirely Disagree

14. Teaching in teams is best for learning to be a design thinker.

- o Entirely Agree
- o Mostly Agree (4 academic members)
- o Somewhat Agree
- o Neutral
- o Somewhat Disagree (1 academic member)
- o Mostly Disagree
- o Entirely Disagree

15. Utilizing a systematic and repeatable process is best for learning to be a design thinker.

- o Entirely Agree (1 academic member)
- o Mostly Agree (4 academic members)
- o Somewhat Agree
- o Neutral
- o Somewhat Disagree
- o Mostly Disagree
- o Entirely Disagree

16. Creativity is an important part of learning to be a design thinker.

- o Entirely Agree (1 academic member)
- o Mostly Agree (4 academic members)
- o Somewhat Agree
- o Neutral
- o Somewhat Disagree
- o Mostly Disagree
- o Entirely Disagree

17. Field research is an important part of learning to be a design thinker.

- o Entirely Agree (5 academic members)
- o Mostly Agree
- o Somewhat Agree

- Neutral
- Somewhat Disagree
- Mostly Disagree
- Entirely Disagree

18. Gaining empathy for people is an important part of learning to be a design thinker.

    - Entirely Agree (5 academic members)
    - Mostly Agree
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

19. Identifying the right problem to solve is an important part of learning to be a design thinker.

    - Entirely Agree (4 academic members)
    - Mostly Agree (1 academic member)
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

20. Framing the right problem to solve is an important part of learning to be a design thinker.

    - Entirely Agree (5 academic members)
    - Mostly Agree
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

21. Visualizing ideas is an important part of learning to be a design thinker.

    - Entirely Agree
    - Mostly Agree (4 academic members)
    - Somewhat Agree (1 academic member)
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

22. Developing more than one solution is an important part of learning to be a design thinker.

- Entirely Agree (1 academic member)
- Mostly Agree (4 academic members)
- Somewhat Agree
- Neutral
- Somewhat Disagree
- Mostly Disagree
- Entirely Disagree

23. Prototyping is an important part of learning to be a design thinker.

- Entirely Agree (1 academic member)
- Mostly Agree (4 academic members)
- Somewhat Agree
- Neutral
- Somewhat Disagree
- Mostly Disagree
- Entirely Disagree

24. Iterating solutions is an important part of learning to be a design thinker.

- Entirely Agree (5 academic members)
- Mostly Agree
- Somewhat Agree
- Neutral
- Somewhat Disagree
- Mostly Disagree
- Entirely Disagree

Appendix G

Survey 4

Academic Research Survey – Elements of Design Thinking

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

IRB study number: STU201508

Participation:

I'm asking for your participation in this research study because you are a business student at the Kellogg School of Management - Northwestern University, who has completed the design thinking course, Research-Design-Build (RDB).

I seek to understand, in your opinion, your experience before and after Research-Design-Build and the difficulties in learning and the value you place post your design thinking experience with the following specific design thinking elements: Ethnographic research, empathy, identifying the right problem to solve, framing the right problem to solve, visualizing ideas, developing more than one solution, storyboarding, prototyping, iterating solutions, critique, creativity, and studio culture.

Implications:

- This survey is completely voluntary.
- You will be anonymous.
- There is no right or wrong answer.
- This survey has no implications on your academic standing at Northwestern University.
- By completing this survey, you will have agreed to participate.

Definition of terms used in survey:

- Provided as part of survey for reference.

Logistics:

- This online survey will be administrated by an independent entity.
- Please submit electronically.

Definition of terms used in survey:

Design Thinking: A methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human behavior.

Ethnographic Research: is an anthropology based research approach used in the field of social science to study people and cultures in context. It seeks to collect deep insights on people and the rationale behind their behavior. Additionally, smaller sample sizes are utilized.

Empathy: The ability to understand another person from their perspective. This is done by placing oneself in the shoes of another and feeling what they are experiencing. It involves developing an understanding of both a persons' emotional and rational needs and wants, which creates a heightened sensitivity to the audience.

Framing the problem: A process for narrowing and pinpointing the right problem to solve through evidence and constraints.

Visualizing ideas: A tangible way of developing, building and conveying ideas in a visual way.

Storyboarding: A graphically visual way to display a sequence of events. Often used to visualize a user journey, product idea or service experience.

Prototyping: To bring an early stage idea to life through the act of building out the concept in order to test and learn from.

Iteration: The act of learning and evolving ideas.

Creativity: The ability to perceive something in new and imaginative ways through thinking and then producing something original.

Studio Culture: A dynamic and flexible mindset and physical environment that is creative, which promotes the development of highly visible content for collaborative engagement and the creation of new ideas.

Survey 4: (Includes the numbers of students per response)

Ethnographic Research

1. Before taking Research-Design-Build, I understood ethnographic research.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (13 students)
   - Neutral
   - Somewhat Disagree (29 students)
   - Mostly Disagree (37 students)
   - Entirely Disagree (41 students)

2. After taking Research-Design-Build, I understood ethnographic research.

   - Entirely Agree
   - Mostly Agree (97 students)
   - Somewhat Agree (14 students)
   - Neutral
   - Somewhat Disagree (9 students)
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to conduct ethnographic research difficult.

   - Entirely Agree (21 students)
   - Mostly Agree (92 students)
   - Somewhat Agree (7 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find ethnographic research valuable.

   - Entirely Agree (87 students)
   - Mostly Agree (10 students)
   - Somewhat Agree (7 students)
   - Neutral
   - Somewhat Disagree (16 students)
   - Mostly Disagree
   - Entirely Disagree

Empathy

1. Before taking Research-Design-Build, I understood empathy.

   - Entirely Agree
   - Mostly Agree (18 students)
   - Somewhat Agree (32 students)
   - Neutral
   - Somewhat Disagree (5 students)
   - Mostly Disagree (55 students)
   - Entirely Disagree (10 students)

2. After taking Research-Design-Build, I understood empathy.

   - Entirely Agree
   - Mostly Agree (92 students)
   - Somewhat Agree (18 students)
   - Neutral
   - Somewhat Disagree (10 students)
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to gain empathy difficult.

   - Entirely Agree (25 students)
   - Mostly Agree (71 students)
   - Somewhat Agree (7 students)
   - Neutral
   - Somewhat Disagree (17 students)
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find empathy valuable.

   - Entirely Agree (92 students)
   - Mostly Agree (28 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Identifying the Right Problem to Solve

1. Before taking Research-Design-Build, I understood how to identify the right problem to solve.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (43 students)
   - Neutral
   - Somewhat Disagree (59 students)
   - Mostly Disagree (18 students)
   - Entirely Disagree

2. After taking Research-Design-Build, I understood how to identify the right problem to solve.

   - Entirely Agree
   - Mostly Agree (94 students)
   - Somewhat Agree (26 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to identify the right problem to solve difficult.

   - Entirely Agree
   - Mostly Agree (83 students)
   - Somewhat Agree (37 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find how to identify the right problem to solve valuable.

   - Entirely Agree (107 students)
   - Mostly Agree (13 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Framing the Right Problem to Solve

1. Before taking Research-Design-Build, I understood how to frame the right problem to solve.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (23 students)
   - Neutral
   - Somewhat Disagree (80 students)
   - Mostly Disagree (17 students)
   - Entirely Disagree

2. After taking Research-Design-Build, I understood how to frame the right problem to solve.

   - Entirely Agree
   - Mostly Agree (85 students)
   - Somewhat Agree (19 students)
   - Neutral
   - Somewhat Disagree (16 students)
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to frame the right problem to solve difficult.

   - Entirely Agree
   - Mostly Agree (19 students)
   - Somewhat Agree (65 students)
   - Neutral
   - Somewhat Disagree (36 students)
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find how to frame the right problem to solve valuable.

   - Entirely Agree (103 students)
   - Mostly Agree (17 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Visualizing Ideas

1. Before taking Research-Design-Build, I understood how to visualize ideas.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (22 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree (80 students)
   - Entirely Disagree (18 students)

2. After taking Research-Design-Build, I understood how to visualize ideas.

   - Entirely Agree
   - Mostly Agree (58 students)
   - Somewhat Agree (35 students)
   - Neutral
   - Somewhat Disagree (19 students)
   - Mostly Disagree (8 students)
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to visualize ideas difficult.

   - Entirely Agree (85 students)
   - Mostly Agree (14 students)
   - Somewhat Agree (10 students)
   - Neutral
   - Somewhat Disagree (11 students)
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find how to visualize ideas valuable.

   - Entirely Agree (17 students)
   - Mostly Agree (81 students)
   - Somewhat Agree (22 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Developing More than one Solution

1. Before taking Research-Design-Build, I understood how to develop more than one solution.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (73 students)
   - Neutral
   - Somewhat Disagree (34 students)
   - Mostly Disagree (13 students)
   - Entirely Disagree

2. After taking Research-Design-Build, I understood how to develop more than one solution.

   - Entirely Agree (11 students)
   - Mostly Agree (93 students)
   - Somewhat Agree (6 students)
   - Neutral
   - Somewhat Disagree (10 students)
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to develop more than one solution difficult.

   - Entirely Agree
   - Mostly Agree (79 students)
   - Somewhat Agree (22 students)
   - Neutral
   - Somewhat Disagree (19 students)
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find how to develop more than one solution valuable.

   - Entirely Agree (18 students)
   - Mostly Agree (95 students)
   - Somewhat Agree (7 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Storyboarding

1. Before taking Research-Design-Build, I understood how to storyboard.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (9 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree (89 students)
   - Entirely Disagree (22 students)

2. After taking Research-Design-Build, I understood how to storyboard.

   - Entirely Agree
   - Mostly Agree (62 students)
   - Somewhat Agree (29 students)
   - Neutral
   - Somewhat Disagree (17 students)
   - Mostly Disagree (12 students)
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to storyboard difficult.

   - Entirely Agree (78 students)
   - Mostly Agree (22 students)
   - Somewhat Agree (20 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find how to storyboard valuable.

   - Entirely Agree (17 students)
   - Mostly Agree (73 students)
   - Somewhat Agree (30 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Prototyping

1. Before taking Research-Design-Build, I understood how to prototype.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (31 students)
   - Neutral (19 students)
   - Somewhat Disagree (53 students)
   - Mostly Disagree (6 students)
   - Entirely Disagree (11 students)

2. After taking Research-Design-Build, I understood how to prototype.

   - Entirely Agree (10 students)
   - Mostly Agree (70 students)
   - Somewhat Agree (29 students)
   - Neutral
   - Somewhat Disagree (11 students)
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to prototype difficult.

   - Entirely Agree (17 students)
   - Mostly Agree (16 students)
   - Somewhat Agree (37 students)
   - Neutral
   - Somewhat Disagree (32 students)
   - Mostly Disagree (18 students)
   - Entirely Disagree

4. As a business student, I find how to prototype valuable.

   - Entirely Agree (23 students)
   - Mostly Agree (79 students)
   - Somewhat Agree (10 students)
   - Neutral
   - Somewhat Disagree (8 students)
   - Mostly Disagree
   - Entirely Disagree

Iterating Solutions

1. Before taking Research-Design-Build, I understood how to iterate solutions.

   - Entirely Agree
   - Mostly Agree (27 students)
   - Somewhat Agree (54 students)
   - Neutral
   - Somewhat Disagree (25 students)
   - Mostly Disagree (14 students)
   - Entirely Disagree

2. After taking Research-Design-Build, I understood how to iterate solutions.

   - Entirely Agree (19 students)
   - Mostly Agree (83 students)
   - Somewhat Agree (18 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to iterate solutions difficult.

   - Entirely Agree
   - Mostly Agree (85 students)
   - Somewhat Agree (22 students)
   - Neutral
   - Somewhat Disagree (13 students)
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find how to iterate solutions valuable.

   - Entirely Agree (18 students)
   - Mostly Agree (88 students)
   - Somewhat Agree (14 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Critique

1. Before taking Research-Design-Build, I understood how to critique.

   - Entirely Agree
   - Mostly Agree (19 students)
   - Somewhat Agree (46 students)
   - Neutral (25 students)
   - Somewhat Disagree (22 students)
   - Mostly Disagree (8 students)
   - Entirely Disagree

2. After taking Research-Design-Build, I understood how to critique.

   - Entirely Agree (39 students)
   - Mostly Agree (64 students)
   - Somewhat Agree (11 students)
   - Neutral
   - Somewhat Disagree (6 students)
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to critique difficult.

   - Entirely Agree
   - Mostly Agree (26 students)
   - Somewhat Agree (36 students)
   - Neutral
   - Somewhat Disagree (47 students)
   - Mostly Disagree (11 students)
   - Entirely Disagree

4. As a business student, I find how to critique valuable.

   - Entirely Agree (82 students)
   - Mostly Agree (38 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Creativity

1. Before taking Research-Design-Build, I understood how to be creative.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (14 students)
   - Neutral
   - Somewhat Disagree (55 students)
   - Mostly Disagree (40 students)
   - Entirely Disagree (11 students)

2. After taking Research-Design-Build, I understood how to be creative.

   - Entirely Agree (14 students)
   - Mostly Agree (71 students)
   - Somewhat Agree (17 students)
   - Neutral
   - Somewhat Disagree (18 students)
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found learning how to be creative difficult.

   - Entirely Agree (49 students)
   - Mostly Agree (58 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree (13 students)
   - Mostly Disagree
   - Entirely Disagree

4. As a business student, I find how to be creative valuable.

   - Entirely Agree (22 students)
   - Mostly Agree (83 students)
   - Somewhat Agree (7 students)
   - Neutral
   - Somewhat Disagree (8 students)
   - Mostly Disagree
   - Entirely Disagree

Studio Culture

1. Before taking Research-Design-Build, I understood studio culture.

   - Entirely Agree
   - Mostly Agree
   - Somewhat Agree (21 students)
   - Neutral (11 students)
   - Somewhat Disagree (45 students)
   - Mostly Disagree (26 students)
   - Entirely Disagree (17 students)

2. After taking Research-Design-Build, I understood studio culture.

   - Entirely Agree (27 students)
   - Mostly Agree (93 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

3. During Research-Design-Build, I found studio culture difficult.

   - Entirely Agree
   - Mostly Agree (8 students)
   - Somewhat Agree (25 students)
   - Neutral
   - Somewhat Disagree (7 students)
   - Mostly Disagree (36 students)
   - Entirely Disagree (44 students)

4. As a business student, I find studio culture valuable.

   - Entirely Agree (8 students)
   - Mostly Agree (89 students)
   - Somewhat Agree (23 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Appendix H

Survey 5

Academic Research Survey – Differentiation and Competitive Advantage

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

IRB study number: STU201508

Participation:

I'm asking for your participation in this research study because you are a business student at the Kellogg School of Management - Northwestern University, who has completed the design thinking course, Research-Design-Build (RDB).

I seek to understand, in your opinion, the value you place on design thinking as a differentiator and a competitive advantage after having taken the design thinking class, Research-Design-Build.

Implications:

- This survey is completely voluntary.
- You will be anonymous.
- There is no right or wrong answer.
- This survey has no implications on your academic standing at Northwestern University.
- By completing this survey, you will have agreed to participate.

Definition of terms used in survey:

- Provided as part of survey for reference.

Logistics:

- This online survey will be administrated by an independent entity.
- Please submit electronically.

Definition of terms used in survey:

Design Thinking: A methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human behavior.

Empathy: The ability to understand another person from their perspective. This is done by placing oneself in the shoes of another and feeling what they are experiencing. It involves developing an understanding of both a persons' emotional and rational needs and wants, which creates a heightened sensitivity to the audience.

Innovation: The creation and application of a viable new offering/solution that meets new requirements, unarticulated needs, or existing market needs.

Survey 5: (Includes the numbers of students per response)

Part 1 – Design Thinking Differentiation

1. A design thinking approach to problems is different than a business approach to problems, based on my classroom experiences.

   - Entirely Agree (164 students)
   - Mostly Agree (16 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

2. A design thinking approach gives me another set of tools to identify and solve problems for users/customer, based on my classroom experiences.

   - Entirely Agree (158 students)
   - Mostly Agree (22 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

3. A design thinking approach allows me to understand users/customer in a way that a data driven business approach could not, based on my classroom experiences.

   - Entirely Agree (48 students)
   - Mostly Agree (115 students)
   - Somewhat Agree (17 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

4. A design thinking approach allows me to get closer to the true needs of users/customer in a way that a data driven business approach could not, based on my classroom experiences.

    - Entirely Agree (122 students)
    - Mostly Agree (58 students)
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

5. Utilizing a design thinking approach in combination with a business approach, allows me to see and lead more holistically.

    - Entirely Agree (159 students)
    - Mostly Agree (21 students)
    - Somewhat Agree
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

Part 2 – Design Thinking Competitive Advantage

1. Business students can learn and utilize a design thinking approach, based on my classroom experiences.

    - Entirely Agree (159 students)
    - Mostly Agree (9 students)
    - Somewhat Agree (12 students)
    - Neutral
    - Somewhat Disagree
    - Mostly Disagree
    - Entirely Disagree

2. Business students who have learned a design thinking approach have a competitive advantage over business students who have not learned design thinking, based on my classroom experiences.

    - Entirely Agree (164 students)
    - Mostly Agree (9 students)
    - Somewhat Agree (7 students)
    - Neutral
    - Somewhat Disagree

- Mostly Disagree
- Entirely Disagree

3. Business students who have learned design thinking can utilize it to gain empathy and a deep understanding about users / customers than business students who have not learned design thinking, based on my classroom experiences.

   - Entirely Agree (155 students)
   - Mostly Agree (17 students)
   - Somewhat Agree (8 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

4. Business students who have learned design thinking can utilize it to make more informed decisions about users / customers than business students who have not learned design thinking, based on my classroom experiences.

   - Entirely Agree (148 students)
   - Mostly Agree (32 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

5. Business students who have learned design thinking can utilize it to develop more innovative solutions for users / customers than business students who have not learned design thinking, based on my classroom experiences.

   - Entirely Agree (121 students)
   - Mostly Agree (32 students)
   - Somewhat Agree (27 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

6. Design thinking is a valuable approach to identifying the right problem to solve for business students, based on my classroom experiences.

   - Entirely Agree (158 students)
   - Mostly Agree (22 students)
   - Somewhat Agree
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

7. Design thinking is a valuable approach to problem solving for business students, based on my classroom experiences.

   - Entirely Agree (151 students)
   - Mostly Agree (9 students)
   - Somewhat Agree (20 students)
   - Neutral
   - Somewhat Disagree
   - Mostly Disagree
   - Entirely Disagree

Appendix I

Kellogg MBA Student Interview Email Invite

Dear XYZ,

I'm working on my PhD through Coventry University in the UK and would like to conduct a structured one on one interview with you over the next 2-3 months as part of my research.

The topic area is design thinking in business education.

There are no right or wrong answers and I highly value your perspective……again, this is not NU related. You will be anonymous.

Could you let me know of your willingness via email, and I'll put together a doodle calendar that we can schedule around. The interview will take between 1 to 2 hours.

If you are not interested in participating, I completely understand.

Simply email me if you are willing to participate.

The IRB study number is: STU201508

Thank you,

Professor Holderfield

Appendix J

Kellogg MBA Student Interview Consent

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

The IRB study number: STU201508

Consent form framework provided by the Office of Research – Northwestern University

Introduction

I am Greg Holderfield, a doctoral student at Coventry University, School of Design

Here is why you are being asked to take part in this research study

I'm asking you to take part in this research study because you are business student with no design thinking experience prior to business school, and have taken the design thinking class Research-Design-Build.

This is what you should know about being in a research study

Whether or not you take part is up to you.

You can choose not to take part. You can also agree to take part and later change your mind.

Your decision will not be held against you.

You can ask all the questions you want before you decide.

Here is who you can talk to

If you have questions, concerns, or complaints, or think the research has hurt you, you can talk to the Principal Investigator, Greg Holderfield, at [redacted]

Your questions, concerns, or complaints are not being answered by the research team.

You cannot reach the research team.

You want to talk to someone besides the research team.

You have questions about your rights as a research participant.

You want to get information or provide input about this research.

This is why the research is being done

The purpose of this research is to understand if increasing the understanding and use of empathic design could have an impact on business decision making with respect to meeting user needs in a more meaningful way?

If you say that "Yes, you want to be in this research," here is what you will do

If you agree to participate, you will participate in a 1-2 hour in person interview by me, the principal investigator. This interview will be audio-recorded so that I may later transcribe the interview and use as part of my personal PhD thesis. Audio-recording is mandatory to participation. If you do not agree to be audio-recorded, then you cannot participate in this research study.

If you say that you do not want to be in this research, this is what will happen

You can decide not to participate in this research and it will not be held against you.

You can say "Yes," but change your mind later

You can leave the research at any time and it will not be held against you. We can end the interview at any time. Just let me know if you want to do this. If this happens, I will ask you if any data collected up until that point may be used in the research.

<u>You can skip any questions you do not wish to answer or ask to end the interview at any point.</u>

This is what will happen to the information collected for this research

You will not be personally listed in the research and as such you will be anonymous. This information may or may not be used as part of my PhD research.

Consent:

I agree to take part in this research as described above.

Signature of participant	Date
Printed name of participant	
Signature of person obtaining consent	Date
Printed name of person obtaining consent	

Appendix K

Interview 1: Student Interview

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

IRB study number: STU201508

Participation:

I'm asking for your participation in this research study because you are a business student at the Kellogg School of Management - Northwestern University, who has completed the course, Research-Design-Build (RDB).

I want to understand, in your opinion and based on your work experience, academic experience within business school education and in Research-Design-Build (RDB), how you respond to the following questions regarding your background, business school experience, RDB, teaching/learning.

Participation Implications:

- This survey is completely voluntary.
- You will be anonymous.
- There is no right or wrong answer.
- This interview has no implications on your academic standing at Northwestern University.
- By completing this interview, you will have agreed to participate.

Participation Logistics:

- The interview content will be shared with you in person.

- Data collection will be conducted by way of me documenting your answers in front of you.
- I will be recording our session in order to make sure I have captured your answers correctly.
- The audio recording will be transcribed and outputted as a document for use in the research.
- You are free to stop this session and end the participation at anytime.

Interview Questionnaire:

PART A

Tell me about your background prior to coming to business school to earn an MBA.

1. Where did you go for your undergraduate education?

2. What did you study?

3. What was your degree?

4. Where was your last job prior to coming to graduate school for your MBA?

5. What was your primary function?

6. Did this organization have an innovation process?

7. If so, was their innovation process successful?

8. If so, did their innovation process inform the decision-making process for the organization?

9. Did your past organization employ empathic methods as part of its innovation process?

10. Prior to coming to graduate school for your MBA, did you personally used empathic methods, within your innovation process in the business world?

11. Prior to coming to graduate school for your MBA, how confident were you, using empathic methods as part of your innovation process in the business world?

PART B

Tell me about your MBA experience.

1. Why did you decide to go back to school and earn an MBA?

2. Describe to me the core MBA curriculum that you are taking.

3. What skills are stressed as part of the core MBA curriculum that you are taking?

PART C

Tell me about your experience using the tools and perspective taught to you in the Research-Design-Build class at Northwestern University.

1. In the design thinking process that you were taught, was qualitative ethnographic research valuable in identifying user needs?

2. Did qualitative ethnographic research yield a more empathic understanding of users?

3. Were the decisions you made, relating to the innovation process and outcomes, of better quality when they were informed through design thinking?

PART D

The following are thematic questions around design thinking, decision making, empathy etc., as per the research.

1. In your opinion, can increasing the understanding and use of design thinking have an impact on business decision making with respect to meeting user needs?

2. In your opinion, does the introduction of a design thinking approach to the curriculum of students of business studies improve their understanding of user needs in their decision making?

3. In your opinion can empathy inform the decision-making process of business leaders?

4. In your opinion, does qualitative ethnographic research lead to a more empathic

approach to innovation when compared to a quantitative data driven approach to innovation?

5. In your opinion, is empathy valuable to you as a business leader when developing innovation solutions for end users?

6. In your opinion, could the use of qualitative design thinking in combination with quantitative data driven design lead to more meaningful innovative solutions for users?

PART E

The following are thematic questions around teaching and language, as per the research.

1. Does teaching design thinking have value in business schools?

2. What is needed to effectively teach design thinking to business students?

3. Is it important to understand and speak the language of design in business?

Appendix L

Kellogg MBA Student Interview Example

Thank you. Let's begin. Okay. Part A, tell me about your background prior to coming to business school to earn an MBA. Question one, where did you go for your undergraduate education?

A: [redacted]

Q: And what did you study?

A: I studied electrical engineering, with a focus on radio frequency electronics.

Q: And your specific degree?

A: It was a bachelor's of science in electrical engineering.

Q: Question four, what was your last job prior to coming to graduate school for your MBA?

A: My last job, prior to coming to graduate school, was a product development engineer at Fiat-Chrysler Motors for in-vehicle entertainment systems.

Q: And your primary function?

A: My primary function was product execution, which also actually involved upstream activities, such as product vision, definition, and sourcing.

Q: Can you elaborate a little bit on product execution at Chrysler-Fiat?

A: So product execution is more of a technical take on project management. Not only are you deciding, you know, when things to get done, but you're deciding the technical trade-offs when there are, kind of, different trade-offs. So let's say a feature wouldn't be able to be shipped on time. You would make the decision whether or not to do it, or to de-rate your product to possibly include a lesser, lesser spec'd feature.

Q: And how were you making those determinations? What information were you using?

A: I mean, a lot of it was probably just a logical decision process. Time, money, And like, the effect on customer usage. So is it a feature that people need? Do we need it? Does it, is it, are we legally obligated to have it, would all be considerations there.

Q: So question six, did this organization have an innovation process? Yes or no.

A: Yes.

Q: And so can you describe that to me briefly?

A: So there's probably two sources of innovation. And on the engineering side, it's mainly product innovation. One would be attached to a vehicle program, and you, the engineer responsible would essentially be tasked with getting buy off from the vehicle level to get his new innovation, or feature, request funded by the vehicle, you know, just being an iteration on the current product. The next would be what we call de-coupled development, where anyone in the organization can essentially have an idea that they want to explore, get money

for that idea, and then find a supplier to help execute it.

Q: Question seven, was the innovation process successful? Very, partly, rarely, or never.

A: It was partly. Some products that were well-scoped, and didn't have feature creep, could successfully kind of produce a prototype and then launch. Other products, you know, the organization would have, would see some sort of convergence in technologies and start mashing different products together. And with so many stakeholders that sometimes those projects weren't, necessarily, very successful.

Q: Okay. Question eight, did the innovation process inform the decision-making process for the organization? Yes or no.

A: Yeah. And I think where it informed decisions was on current products. So you know, you can think of the vehicle as like a collection of a thousand products, with all different life cycles and all different interfaces that are continually evolving. So if one vehicle's trying to do, or module is trying to do an upgrade, and it has to interact with another module, you may or may not decide to do that upgrade, if that other module will never be updated.

Q: Question nine, did your past organization employ empathic methods as part of its innovation process? Yes or no.

A: Yes. They probably didn't manifest themselves with direct user interviews. The design office was trying to do persona development, to understand what the life is of a user in our vehicles throughout the day. The other would be our HMI team, so human machine interface team, which was tasked with essentially bringing in people and watching them use different things in the vehicle, to make sure that, you know, what we were doing did make sense in a user context, who didn't have familiarity with the project.

Q: So when you spoke previously around the effect on the user, this was, this information was gleaned specifically from this HMI team?

A: So that's where certain things would break down, right? Because HMI team wasn't responsible for marketing.

Q: Okay. So can you elaborate on that a little bit?

A: Yeah. So what you might see is, you've probably got a few different stakeholders, you've got the design office. You've got the H-, who's responsible, who is traditionally responsible for graphics, and for surfaces. You've got the HMI team, who's responsible for making sure that the user is able to execute a function. And you've got a vehicle integration team, who's “the voice of the customer.” But they are not a pure marketing team, who's responsibility is profit, who is looking to see the business case behind some of these, you know, different activities. So they may or may not know that a customer wants to do something through, VIT may or may not know a customer wants to do something through user research, but they don't understand what it means to the business.

Q: I see.

A: And then they'll work downstream with HMI and the design team to get something that they think defines the product, but then they need to talk to the engineers to understand what the architecture is. So what ends up happening, well, what I thought would end up happening, from my perspective as an engineer, is engineering ends up owning the process, because they're responsible for execution.

Q: So you thought that. Was that, did that prove itself to be true, that you owned the process or not?

A: Yeah. I mean, I'd say I would be the main driving force, you know, for taking steps to complete activities. Because no one else had direct responsibility for that product.

Q: So when you were, as the driving force, and you were working through the process, was your group using empathic method at all to inform your decision making?

A: No. We wouldn't be. We'd be using our own, kind of, instincts, and instincts of the people around us.

Q: Alright. And you were never given information on users from other groups, that would help inform that?

A: I'd say we wouldn't have the direct data, but we'd have synthesized data.

Q: Okay. So you had some data on it, but you weren't participating in the discovery of?

A: Yeah. I didn't fully understand certain things, but I knew, you know, we had three pillars for this system. And I knew that, you know, when evaluating features to include, or whether not to include them, you know, we'd go back to that original product vision.

Q: Okay. Thank you. Question ten, prior to coming to graduate school for your MBA, did you personally use empathic methods within your innovation process, in the business world? Yes or no.

A: No, not directly.

Q: Okay. And so, it sounded like some of this stuff was happening organically within your group? You know, based on some-

A: Yeah.

Q: Some information. Some gut feel-

A: Right.

Q: Based on those insights.

A: Definitely.

Q: Okay.

A: And possibly, like, one of the illuminating, kind of quote or feature, what you'll hear in the automotive industry is some executive's wife doesn't like the function, change it.

Q: Really.

A: Yeah. Because the, what we'll do is we'll put the system in cars and they'll drive them around And you know, the executives will give them to their family members. And you know, you'll hear back that someone's wife couldn't do something, or didn't like something.

Q: So again, that was more organic, not process oriented, and you were not participating in it?

A: Right.

Q: Okay.

A: Yeah.

Q: So question eleven, again, this is your opinion. Answer it the best you can, knowing sort of your involvement, but prior to coming to graduate school for your MBA, how confident were you using empathic methods as part of your innovation process in the business world? Very, partly, rarely, or never.

A: I mean, partly or rarely on this.

Q: Okay.

A: I'd say, you know, sometimes I would reach out, but I wouldn't understand the value in reaching out, so I wouldn't really pursue it as, kind of, as much as I possibly would today.

Q: Because it wasn't an institutionalized process for your group, is that why?

A: Right.

Q: And you didn't have formalized training in it?

A: Right.

Q: And can I assume that you weren't rewarded for using it.

A: I mean, that's correct. Yeah.

Q: Okay.

A: Yeah. I mean, if you look at the incentives of my group, the incentives of my group are to strip down features to ship on time. That's-

Q: So you're really looking at optimization?

A: Yeah. I mean, if you look at, like, what it takes for an engineer to succeed, we're fully graded on whether or not we ship on cost and on time. And that doesn't exactly align itself with a rich user experience.

Q: Yeah. Okay. That's great. Part B. So let's talk about your MBA experience. Not MMM, not RDB, but your MBA experience, specifically. Question one, why did you decide to go back to school to earn an MBA?

A: Yeah. I mean, I think this goes directly to my Fiat-Chrysler experience, where, you know, I was downstream from initial, kind of, strategic initiatives, user research initiatives, marketing, profit and loss, and I didn't understand why my product meant in the context of the organization. And I thought, to have those tools, those would be, kind of, well-studied at an MBA program.

Q: And can I infer that you had aspirations to move to more strategic roles, that had

more engagement with the overall business?

A: Yeah. I mean-

Q: Through, via the MBA.

A: Right.

Q: Yeah.

A: I like strategic roles, but, for me, I want to do, I like doing the whole process. But I just didn't have experience in the strategic roles and didn't know how to really, you know, pursue those activities.

Q: Okay. So again, the decision to go back to school to earn your MBA was to evolve and to grow as a business professional and leader.

A: Right.

Q: Okay. Question two, describe to me the core MBA curriculum that you are taking. So can you walk me through the core courses, with some specifics around them, please.

A: Mm-hmm. So our core courses for the MBA probably started out with accounting, marketing, and business analytics, or decision making. And accounting is mainly to understand what it means when you possibly read a balance sheet, and what kind of activities about the business can you infer. Marketing's all about, kind of, customer segmentation and how to pursue

different customers that may be in your target market. And then, decision making is, you know, once you have data possibly on these users, you know, what variables might matter to these users. But, it can also be used in different contexts, so, you know, should we or should we not go launch a restaurant in a given area and what variables may determine whether or not that's going to be successful initiative.

Q: How is that information-

A: But, I guess there's, sorry.

Q: Yep. Sorry.

A: There's strategy, too.

Q: Yeah. Yeah. Let's talk about that .

A: The strategy courses, so understanding what assets and activities a firm has that are unique to maybe give that firm above average industry profits, why are certain industry profit levels lower than others. We look at MORS. So this is a leadership, our crash course in leadership initiatives, and thought leadership and understanding what different biases people might have and how to get around those biases when leading groups. And then we have operations, which is operations. It's possibly having, understanding leading indicators for the health of your business. Whereas accounting has lagging indicators, operations would be leading. And then, finance. So capital structure and why it's important, and how it may or may not incentivize your firm to take on risk or to shed risk. And micro-econ, understanding pricing and pricing differentiation, and different methods for maximizing firm profit among a diverse set of users.

Q: Terrific. Question three. Of these core courses, what skills are stressed as part of

the curriculum?

A: The skills that are stressed are, I think, critical thinking And you know, each of these classes, they overlap somewhat and what you kind of find is they have different, maybe, area-specific frameworks that you'd use to evaluate different problems. So you know, there's similar problems across firms and how do you use, you know, an operations perspective to increase efficiency? How do you use an accounting perspective to evaluate what's going wrong and how might you use a finance perspective to understand what they should be doing once they're, you know, once they're done pursuing these, you know, new profit-making activities. And so you use all these different tools, and lenses, and different case studies to kind of improve businesses and firms.

Q: So with these tools and lenses, what sort of information is being inputted into that, to sort of frame the perspective for decision making?

A: So that's, I don't know. Can you clarify that a little bit?

Q: Yeah. Is the information quantitative, in that it's data-based, data-oriented? Or, is it, are you doing things in certain coursework that is more qualitative in nature?

A: Sometimes. So strategy, I'd say was pure logic-based. There was, you know, very few numbers that you actually had to come up with, but it was, you know, what activities and assets does this firm have, or what are they doing that's unique to them. And what are the trade-offs associated with pursuing those activities versus other activities. And so there's no numbers there. But, we might take finance and we'd do a full, you know, just kind of cash flow analysis on the business and that's all quan. And it's whether or not should somebody raised money, given, you know, convertible debt, or should they do equity.

Q: Okay. And what about, can, talk to me about the skills that are stressed in the marketing program, marketing coursework.

A: So I didn't, I haven't done any of the more rigorous marketing coursework, so I know [NAME1] has done, I think, research, marketing research. But the marketing courses that, you know, we've taken were basically market segmentation, so there's a body of people that we'd like to pursue, how should we pursue them? You know, are they skaters in California who like Mountain Dew? Or are they, you know, moms in Boston who have a carriage? Like, you just kind of, like, understand who these users are and then how to best curtail a product towards them, but there's no research activity.

Q: And how are you understanding those users?

A: Right. There's no research associated in the core class.

Q: Okay. So no qualitative research. It's all quantitative data?

A: No. Well, no ethnographic research.

Q: No ethnographic research? Okay.

A: Yeah. I mean, we did a case about Omo in Brazil, and they told us the activities of what the users were typically into, and it was right on the paper.

Q: Alright. So you were given the information.

A: Right.

Q: You didn't go out and glean it for yourself. Okay. Part C, tell me about your

experience using the tools and perspective taught to you in the Research-Design-Build class. Question one, in the design thinking process that you were taught, was qualitative ethnographic research valuable in identifying user needs? Very, partly, rarely, or never.

A: I'd say very to partly. The, you know, doing new research in a unfamiliar market, I find that to be very, very valuable. And then, you know, we didn't, we did a project on information kind of management within Kellogg, and that was, you know, even though I did information management by myself every day, it was super valuable to do the ethnographic research to find out each and everybody's kind of different personality quirks, and see maybe why they converged.

Q: Great. Question two, did qualitative ethnographic research yield a more empathic understanding of the users? Always, usually, rarely, or never.

A: Usually.

Q: And can you elaborate on that?

A: So the information project yielded, you know, very empathic understanding of users, because I guess we didn't realize the struggle people went through every day to manage their information. And that was, that was a pretty cool thing to see.

Q: So that was an ‘aha’ moment that came about through the field work?

A: Yeah. I didn't realize how hard everyone had it. And then, the, you know, I'd say usually, maybe, for the Y. Because I think we understood something-

Q: Oh, yeah. That was for your first sprint, right? You did the-

A: Right.

Q: Yeah, yeah, yeah. Yeah, yeah, yeah. Okay.

A: Some things we knew about And you know, we, people had experience with the Y and so, you know, we knew some of the activities. But then there were some things that we didn't know about. And that's where it was-

Q: So with the Y, the YMCA was another project you did in that class. What was your challenge?

A: So we had to understand how the knowledge management system for the Y may evolve.

Q: And so, that was a whole other set of research that you were doing around that specific challenge?

A: Yeah. I mean, it was a new research project, different spin.

Q: And so can you tell me some of the, perhaps, the ‘aha’ moments that you realized during that challenge?

A: Yeah. I think, I think, the biggest thing that we didn't realize was how tight knit of a community the Y was. You know, I had gone to the Y as a gym before, And you know, several other people that I knew did, but it was just a gym. For a lot of these people, it's a tight knit community for, and sometimes a safe haven, for people who may not have, you know, another place to go to spend their time that's safe. And then that community can also build long-lasting relationships. So

I thought that was great.

Q: And you yielded that through your actual in-context field work, your interviews with those folks, your observations on site?

A: Yeah. Yeah. You know, one guy, in particular, we interviewed was a janitor there. And you know, we didn't think he had a big stake in the Y, but he went on to tell us that he had gone to the Y when he was in middle school, because his home wasn't safe. And it wasn't until he lost his job when he got older, that he could go back and start working there and felt like he could be a part of that community again.

Q: So he returned back to that community. So that was a unique story that he shared.

A: Yeah.

Q: Okay. That was a great story. Question three, were the decisions you made relating to the innovation process and outcomes of better quality when they were informed through empathic design? So again, this is as it relates to this class. Did it better inform? Always, usually, rarely, or never.

A: Always.

Q: And can you describe some of that, or, perhaps, tell a story based on the projects?

A: Yeah. So I wouldn't just say it was, you know, better quality, but we understood the client even more. You know, initially, when the client came in, I think we were a little surprised that this was, you know, a question. And you know,

people have used knowledge management systems. They know what they need to do. It's, you know, almost to solve problems at some organizations. But then, through empathic design, or, like, empathic research and understanding what these users are doing day in and day out, and understanding the structure of the Y through interviews of the client, we got to see how big a problem it was, And but how necessary it was to possibly solve it. And I don't think that insight could have been yielded from any other type of research.

Q: Let's go to part D. Third page. Question one, in your opinion, again, in your opinion, can increasing the understanding and use of empathic design have an impact on business decision making with respect to meeting user needs? Always, usually, rarely, or never.

A: I'd say usually. And this depends on the organization and the trade-offs associated with it. You know, ideally, you'd create the service or product based off of what exactly that user needs, but in a business context, you know, in automotive with ever-changing product timelines and cycles, you may, And you know, different constraints on money and time, you may or may not be able to pull off, you know, the full experience that you'd like to.

Q: Okay. So constraints play a role in, perhaps, the effectiveness of.

A: Yeah. And which has a direct impact on business decision making.

Q: Yep. Question two, in your opinion, does the introduction of an empathic design approach to the curriculum of students of business studies improve their understanding of user needs in their decision making? Always, usually, rarely, or never.

A: Usually? The, improve the understanding of user needs in their decision making. I mean, always. If you can know what the user needs are, through that type of research, then it's going to improve your decision making. And having that data available, I don't think it would typically hurt.

Q: Question three, in your opinion, can empathy inform the decision-making

process of business leaders? Always, usually, rarely, or never.

A: Always. And this is, if it's empathy in general, I mean, this is the kind of big approach where you need to understand people before you make decisions. And you know, empathy doesn't just, isn't just involved in product or service design, and understanding those users, but it's involved in your day to day being able to mediate different conflicts, or being able to mediate a group and understand what the different individual's needs are behind kind of what they're saying. And then also, even firm strategy. Being able to understand who is leading an organization that you may be competing with, or who you're trying to sell to, and to be able to craft the business solution, or your attack vector properly, is a big, you know, a really big, would be a big advantage.

Q: So again, the notion that this has value beyond products and services. This is a platform that can inform lots of different decision-making aspects of a business leader.

A: Right. So one anecdote would be, we had a GM case on whether or not the finance partner should pursue different swap rates for debt. And the answer quantitatively is no. But through discussion, the answer, for the individual person making the decision, is yes, because they look better in the organization. They're not going to be around if this thing fails in ten years, and to understand what that user's incentives is kind of yields big insight into what this firm might actually do from a financial and capital perspective. But from a business leader perspective, you gotta understand that to hopefully align different people's incentives properly in your own organization.

Q: Question four, in your opinion, does qualitative ethnographic research lead to a more empathic approach to innovation, when compared to quantitative, data-driven approaches to innovation? Always, usually, rarely, or never.

A: I would say usually.

Q: Okay. And can you elaborate on that?

A: And the way I'd say that is, I think, ethnographic research is going to get you mostly there. And I think quantitative data will get you partly there, assuming you have the data available. Because you may not always be measuring certain things that people are doing outside of the scope of your metrics. But if you put the two together, and you can see, you can see the user in context using the system, you can look at what things they're doing and measure those things. You can kind of come up with this optimized solution.

Q: Question five, in your opinion, is empathy valuable to you, as a business leader, when developing innovation solutions for end users? Always, usually, rarely, or never.

A: Always.

Q: And can you describe that. Again, this is about you, as a business leader.

A: Yeah. So to me, it's very valuable, because you want to understand if people, you know, what incentive people have to use something. And you may not understand those incentives until you actually do that ethnographic research. So I'm working on, kind of a competitive analysis right now in the used car industry. And it's going to go into a product fit and product vision framing, and it's very valuable to get that first-hand experience of what dealers are doing every day and how they think, to understand how we can capture, kind of a piece of their mind share in their work flow, to extract the data we need to craft a successful solution. And I don't think I would be able to do that analysis properly unless I had, you know, this sense of empathy.

Q: That's a good segue into question six. You alluded to it a little bit in question four. In your opinion, could the use of qualitative empathic design, in combination with quantitative, data-driven design, lead to more meaningful innovative solutions for users? Yes or no.

A: Yes.

Q: And can you elaborate, please?

A: Yeah. I mean, I see ethnographic research as new insights, and I see quantitative data as optimization. The, you know, the ethnographic research is going to get you to, kinda, that next solution, where nobody's looking, but to dial in that approach and to do things for the user that they require, would need some quantitative data. One kind of aspect of that would be, you know, let's say we create a new widget in the vehicle that we found out that users need through research, we'd need to then do the data-driven approach of seeing the ninetieth, ninety-fifth percentile user and the fifth percentile use in the car to make sure that that approach actually works for them.

Q: Can you elaborate a little bit more on how you would perhaps use both? I mean, is there one before the other or are they intertwined? Do you have some thoughts on that?

A: Yeah. So it's probably a little iterative. We see businesses today pursuing quantitative data research, but they lack, but that data lacks breadth. And the reason it lacks breadth is because you, the data only reflects what you're measuring. And so you can optimize for exactly what you're currently doing, but you can't see the next innovation that's maybe a far leap from there, until you actually interview users and do that empathic research. And then, once you do that empathic research, and you find this new approach that you're looking for, then you might drill down and do the optimization with, you know, the new metrics that you're able to measure.

Q: Could the quant play a role up front in sort of identifying potential opportunities to go towards?

A: It could. And the reason is you might see, like, abnormal signals. And so, one guy I was talking to from Amazon, he's like, well some of the data we were

looking at was weird, because people kept like restarting stuff, And you know, we didn't know what was happening. And what they found out, was that, you know, constant play of shows, you know, this feature in Netflix where you, like, finish a show and it goes to the next one, is not suitable for kids. What's suitable for kids is to watch the first show over and over and over and over again. And so they picked up that abnormal signal in the data, and then they figured out, through user research what was going on. So you need, you know, both in that approach.

Q: Great analogy. Let's move to part E. This is around the teaching aspect of it. So question one, does teaching empathic design have value in business schools? Always, usually, rarely, or never.

A: I'd say always.

Q: And can you elaborate on that?

A: Yeah. For business students, you know, we get a very large breadth. You know, we get to see finance, but we're not always specifically practicing finance. We can see accounting, but we're not always specifically practicing accounting. Operations, strategy, you know, what have you. And those are all very, kind of, logic-focused events, but in your day to day, you know, you also need this exposure to empathic design, because it's another tool in your tool belt to help frame these problems properly.

Q: Do you think, in your opinion, that empathy is a tool, or empathic design, is a tool that all business students can succeed with?

A: Can succeed with.

Q: Yeah. Using. Or, is it, does it take a special MBA to sort of understand that?

A: Well, I'd put it this way. So people probably subscribe to their strengths.

Q: Yeah.

A: And you know, they have different things that they succeed in. The finance guy succeeds in finance, you know. The marketing guys succeed in marketing. The design research are going to succeed in design research. Now, the more you can, the more master you can exhibit over those different tools, the stronger you're going to be.

Q: Okay. So again, a nice segue from that conversation. Question two, what is needed, in your opinion, to effectively teach empathic design to business students? What do you see as some platforms, or paths, to teach?

A: For business students, I see repetition. Because empathic design is, you know, it's got this big, emotional intelligence piece to it. And it's not something, you know, we do kind of practice as day in, day out talking to people, but we don't focus on, you know, the theory of it to understand how it might manifest itself in day to day living. And so, I think, if you teach the theory behind empathic design, you teach the method, and then you allow people to go practice, that would be an effective teaching path.

Q: Can it be taught effectively, or, let me restate it. If you had two ways of teaching it, case-based or project-based, is one more successful than the other? Does it need to be a combination of the two? Or, you know, when you're looking for this repetition, how would you want that delivered?

A: Yeah. I wouldn't see how it would be case-based. How would it be case-based? Okay. So I could see, like, a client coming to you with a problem-

Q: So you can read about design thinking. You can read about this notion of being an empathic designer-

A: No. You can't do that.

Q: You can study cases for what's already been done.

A: No.

Q: You can look at the data. Or, you can live it and experience it through a project.

A: Right. So you know, there's this kind of thought that humans learn through struggle. I think reading about it is not a struggle, and I think reading about it doesn't really hit you with the same insights that you might get through actually practicing.

Q: Great.

A: Not only that, but you don't get practice in the skill of empathic research, because I think, for some of these people that are very good at it, it is a skill.

Q: And it's a skill that's learned through repetition? Is that what you're saying?

A: Repetition, practice, review.

Q: What about, can you tell me a little bit more about, you know, process. So on the MBA side, you know, there's specific processes that are used, based on subjects. What's important, or can you speak to me of the importance of process as it relates to the teaching?

A: Okay. The, so, the process, maybe we'd say they're almost frameworks?

Q: Yeah.

A: And-

Q: Or the methodologies that you're using to create the frameworks.

A: Yeah, and what it kind of exposes you to is a different way to think. And I think, some of those frameworks, you can maybe think of them like training wheels. You know, you've never thought this way before. We're going to force you to think like this. And then, hopefully, in the future, we can take the training wheels off and you don't have to be forced into it, but you can look at this problem from this new perspective. And that's what I think is the role of, you know, these frameworks or processes that we might have in some of these classes.

Q: Okay. So and knowing that the subject matter may be perceived by some as fuzzy, can you elaborate on, sort of, the importance of rigor, as it pertains to the subject matter?

A: Of empathic design?

Q: Yeah.

A: So it's fuzzy, because you're probably dealing with the unknown.

Q: The unknown, yeah.

A: And not everybody is comfortable with that.

Q: Okay. That's what I want to understand a little bit more. Can you talk to me a little bit about that?

A: Yeah. The empathic design, there's no clear path forward. But, I think, through kind of practicing and doing repetitions, you can find your stride and a way to, kind of, probe around the problem, or talk to a user, understand if that information is valuable, and use it or move on. And how to, kind of, keep curtailing your research to get better and better data and better and better insights. But, that's a really fuzzy thing, because it's really a durative for people. You know, they have to do it and try that approach, and if it was good, great, they can succeed and get that carrot. If they don't do it, and they don't succeed, well, they might get discouraged if they don't have the tenacity to keep going after it.

Q: So there's a mindset that's important here?

A: There is, yeah, there's a mindset, because it's, right, it's building a skill. Anytime you learn something new, if you're picking up the violin, you've got to struggle through it. It's not immediate gratification of playing Beethoven's Fifth, or whatever people play on the violin.

Q: Thank you. Let's go to question three. Is it important, to you, in your opinion, to understand and speak the language of design in business? Always, usually, rarely, or never.

A: I'd say usually, depending on the role.

Q: Yep. And can you elaborate on that a little bit?

A: So for roles where you're maybe doing growth strategy or product fit, that directly involves product or services, which may be most things-

Q: Yes.

A: It's very, I think it's very important to speak the language of design. And that's, you know, framing what you see what the business doing, in terms of what the tangible product output will be and you need to be able to speak the language of design to certain designers to get the results you want.

Q: And is it important in that that gives you sort of an authentic voice as a leader? If you're working in the space of innovation?

A: I don't know if it gives you an authentic voice, but it gives you a good critique, the ability to ask-

Q: The right questions.

A: The right questions, is important. Because, you can never be a subject matter expert if you're, you know, being some sort of, in some sort of leadership position, but be able to speak with somebody and relate to them, and then build the logic of their process, is important, because then you take that logic and their framework and their process and you translate it to, you know, what you need as a leader. And that's where, you know, the language of design kind of crosses that boundary. And then in digital products, and tangible products, today, you know, people working with designers. And they need to have those kind of thoughtful discussions, instead of always take exactly what's given to them.

Q: So do you see, as a future business leader, the, a greater opportunity to be participating in those discussions? I mean, is that something that you see is going to be important to you, as a business leader, in decision making? That you're going to be involved with designers. You're going to be involved with users. You're going to be involved with design thinking processes that will help

advance your innovation?

A: Yeah. I'd hope so. And you know, if you kind of take the perspective of I will be a business leader, you need to do the right things to create an organization that lets those people grow and flourish.

Q: Right.

A: Like any other aspect of your business. And so you need to understand what they're doing. Can't just be a black box that outputs cool-looking stuff. You need to understand what drives them, what motivates them, how they speak, how they communicate, to hopefully give them an environment where they're working well and tightly within the rest of the organization. You might even say that some organizations really struggle with this, because they let designers kind of be in a separate place, and not necessarily communicate with the rest of the organization. So you might not get the business requirements you need put into the product. You might not-

Q: So this ability to understand and speak the language of design could help break down those silos of business and design?

A: Yeah. I'd say that's a good way to put it. I have be much better understanding of design and how it can be used more effectively in business. Coming out of RDB I'm much more confident about that language.

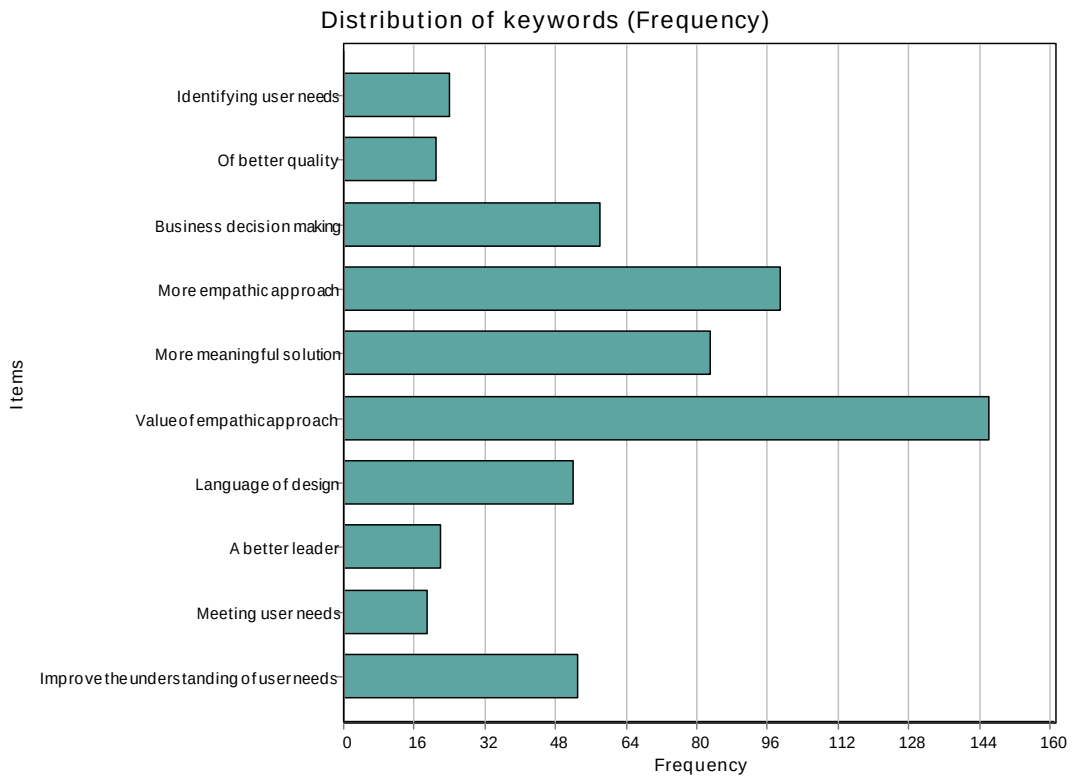
Q: Alright. Did I miss anything? Is there anything else you want to communicate?

A: No. I don't think so. I mean, that's a lot of it.

Appendix M

QDA Miner Student Interview Data

Category	Code	Count	% Codes	Cases	% Cases
Identifying needs	Identifying user needs	24	4.20%	15	55.60%
Quality	Of better quality	21	3.60%	12	44.40%
Decision making	Business decision making	58	10.10%	18	66.70%
Empathy	More empathic approach	99	17.20%	24	88.90%
Meaningful	More meaningful solution	83	14.40%	23	85.20%
Value	Value of empathic approach	146	25.30%	24	88.90%
Language	Language of design	52	9.00%	20	74.10%
Leader	A better leader	22	3.80%	13	48.10%
User needs	Meeting user needs	19	3.30%	10	37.00%
Understanding	Improve the understanding of user needs	53	9.20%	22	81.50%



Category	Code	Case	Text	% Words
Customer1	Closer to the customer	Student 14	understanding your customer is critical. It's like, number one.	0.20%
Customer1	Closer to the customer	Student 3	the qualitative approach, right, that just by definition, you're getting closer to the user	0.20%
Decision making	Business decision making	Student 1	for an engineer to succeed, we're fully graded on whether or not we ship on cost and on time. And that doesn't exactly align itself with a rich user experience.	0.50%
Decision making	Business decision making	Student 1	logical decision process. Time, money, And like, the effect on customer usage	0.20%
Decision making	Business decision making	Student 9	did do initiatives to empower the wage technicians to come up with solutions. But they had to stay within the bounds of, like, the corporate practices,	0.40%
Decision making	Business decision making	Student 9	if it doesn't align with the core processes and the beliefs of what someone in power believes, then it's not going to happen.	0.40%
Decision making	Business decision making	Student 1	we might take finance and we'd do a full, you know, just kind of cash flow analysis on the business and that's all quan. And it's whether or not should somebody raised money, given, you know, convertible debt, or should they do equity.	0.70%
Decision making	Business decision making	Student 4	I personally wouldn't jump up into a qualitative solution without knowing numbers, without knowing that what I'm putting my effort and my team's effort behind is actually – could lead to something, potentially.	0.60%
Decision making	Business decision making	Student 1	different constraints on money and time, you may or may not be able to pull off, you know, the full experience that you'd like to.	0.40%
Decision making	Business decision making	Student 9 (part 2)	I think a lot of times, business decisions need more numbers.	0.50%
Decision making	Business decision making	Student 9	ultimately in a big corporation and also in a conservative corporation, the barriers to innovation are, you know, like the red tape, the bureaucracy. It's, you have an idea and now you got to go talk to like seventeen people to get approval to do it. It's just, it just kills a lot of the simple things that you could execute, right?	1.10%
Decision making	Business decision making	Student 4	There was a business case, there. There was a clear profit opportunity for making the partnership	0.30%
Decision making	Business decision making	Student 1	And the answer quantitatively is no.	0.10%
Decision making	Business decision making	Student 1	I don't think I would be able to do that analysis properly unless I had, you know, this sense of empathy.	0.30%
Decision making	Business decision making	Student 1	then you take that logic and their framework and their process and you translate it	0.20%
Decision making	Business decision making	Student 10	regarding cost, quality, safety, those are the three big buckets. Even though they see that though necessarily we're able to get those things implemented. So like they were trying to promote the change, we are always informing them in a very structured documented way. But even proving that that'll be good for the company, those changes were not necessarily happening.	1.00%
Decision making	Business decision making	Student 4	in my personal opinion, a business leader who does [emphatic]empathic research only, but total disregard to quantitative, wouldn't go far	0.40%
Decision making	Business decision making	Student 6	I think the common thread is optimizing decisions for companies.	0.10%
Decision making	Business decision making	Student 8	A lot of times it's not an empathy driven response, it's a cost minimization or something else	0.30%
Decision making	Business decision making	Student 4	And empathy gives you a very close and personal insight on whatever decision you're making, how that translates, how to translate it within the organization, outside theyour organization, how towould it be received.	0.60%
Decision making	Business decision making	Student 8	I think since our goal, since the goal of the class was mostly focus on desirability, it helps make decisions that maximized desirability	0.30%
Decision making	Business decision making	Student 18	I think every business these days has a ton of digital information and if they haven't already done so they're creating groups in house around that information to help make sure that they get the insights to drive their business decisions	0.30%
Decision making	Business decision making	Student 4	it was almost always based on financials, which respectful financial departments would have to provide.	0.30%
Decision making	Business decision making	Student 11	The specs were primarily defined by two things. One was the market, how the market is evolving.	0.20%
Decision making	Business decision making	Student 11	Second is the performance.	0.10%
Decision making	Business decision making	Student 4	You had to give a very solid business case on how the money would be made.	0.30%
Decision making	Business decision making	Student 6	This is a familiar product in the industry. This is how it's done, you know. It wasn't even a lot of thought to, is this how we should do it? It was, this is it, so this is how the world does derivatives. This is how we should do it.	0.70%

Category	Code	Case	Text	% Words
Decision making	Business decision making	Student 1	And so you use all these different tools, and lenses, and different case studies to kind of improve businesses and firms.	0.30%
Decision making	Business decision making	Student 8	what negotiation thresholds should sales people actually have when they're negotiating deals, to what should be the specific price point for an item they're selling.	0.40%
Decision making	Business decision making	Student 3	it's nice to have qualitative ideas and understandings of people and how things work, but, ultimately, it has to translate into business success, which is almost always measured in profit, for the most part.	0.40%
Decision making	Business decision making	Student 3	going by your gut instinct is one thing and. And often times me and my business partner, [NAME], we might have, like, different gut instincts and, like, that's a great baseline for thinking about changes to the business and what might work for people but. But having the data always, kind of, helps you back it up and helps you, kind of, say concretely, or at least relatively concretely, like, "Hey. This is probably correct, based on the data that we have." So it just brings a different level of insight into the problem	1.10%
Decision making	Business decision making	Student 3	we realized that in order to stay ahead of the competition toand keep meeting student needs, that we'll always have to be continually adapting	0.30%
Decision making	Business decision making	Student 8	the guiding philosophy behind our company was very quantitative driven, so there's almost no decisions that would be made without some sort of quantitative backing,	0.40%
Decision making	Business decision making	Student 7	So it could just really help you with each gating decision.	0.10%
Decision making	Business decision making	Student 11	We started off qualitatively creating a solution based on those insights, but then to convince the audience, we then did some number crunching and tried to see if we really do this what benefit are we expected to get and that helped.	0.60%
Decision making	Business decision making	Student 18	if you don't know how to ask the right questions about that than you can end up maybe drawing the wrong conclusions and ultimately making the wrong business decisions.	0.20%
Decision making	Business decision making	Student 7	you may have identified the most interesting need ever in world of lactating mothers, but you inject in the data and you realize, shit, you know, this issue we've unearthed only affects .7% of mothers so --	0.40%
Decision making	Business decision making	Student 15	Decisions that are focused on meeting individual needs and feelings as opposed to the mass or the average.	0.30%
Decision making	Business decision making	Student 12	it's important to operations and strategy, because, like, marketing makes decisions.	0.10%
Decision making	Business decision making	Student 6	a functional perspective.	0.00%
Decision making	Business decision making	Student 6	we did a lot of research on how we could implement the idea internally	0.20%
Decision making	Business decision making	Student 12	the link between customer and user preferences and profit	0.10%
Decision making	Business decision making	Student 12	because that's what drives–like, everybody over and over and over, customer focus, customer focus, customer focus.	0.20%
Decision making	Business decision making	Student 6	any time I'm developing a solution, I need to be thinking about who it's going to impact-	0.30%
Decision making	Business decision making	Student 18	I'm going to try to think of when we're making a decision, what are we trying to accomplish here, you know, who are we serving ultimately with this solution or this process and how is this decision going to effect the addressing of their needs so absolutely.	0.40%
Decision making	Business decision making	Student 23	the way in which we could put together that proposal most effectively was to think about what's the incentive structure in the client organization, what are they basing their decisions on?	0.30%
Decision making	Business decision making	Student 17	You had to figure out what you're willing to sacrifice to save costs from a business perspective, but you also understand, like, how far you can push that and if you do want to push that, at the risk of losing customers, and at the risk of not delivering what your customers want	0.60%
Decision making	Business decision making	Student 5	as we had learned in the class, we had used different methods of organizing a lot of our insights that we collected and frameworks to organize them. And through doing that, we were able to get a clear picture of where the path forward was	0.50%
Decision making	Business decision making	Student 7	One is the financial side: what types of debt instruments are being used, how are they being used, in what manner are they being applied to this particular investment. And the second is all around the legal structuring: how are particular risks either ring-fenced and/or carved out and left with the seller, things like that. So those, they would send a financial and legal side as it relates to the transaction, that's where the innovation would come.	0.80%
Decision making	Business decision making	Student 7	This was solely ad hoc and in reaction to the specific context of a particular transaction	0.20%

Category	Code	Case	Text	% Words
Decision making	Business decision making	Student 15	I think empathy can inform decisions, and it probably does. It's just probably a matter of how much and how much effort business leaders are willing to put into it.	0.40%
Decision making	Business decision making	Student 17	So I think, at the end of the day, like, for a consulting firm, you have to have a feasible and a viable recommendation	0.30%
Decision making	Business decision making	Student 15	Like it's not a given that just because you– it's in your curriculum that you're going to go forward and use it to make business decisions.	0.40%
Decision making	Business decision making	Student 2	we put a big emphasis on empowering people who maybe didn't have a voice in the process before and so yeah	0.50%
Decision making	Business decision making	Student 1	this is the kind of big approach where you need to understand people before you make decisions.	0.20%
Decision making	Business decision making	Student 2	So empathic design always makes – informs business decisions with respect to user needs. It just doesn't always look the same.	0.50%
Decision making	Business decision making	Student 5	I think it can inform the decision-making process of business leaders, but the one thing that has been taught to me in finance is if you're a public company, you're at the will of your shareholders. And it is your job to, you know, enhance the bottom line. It's, you know, you always have that commitment to your shareholders, so as long as it's informing you and directing you to a decision that is doing that, yes, I agree.	1.00%
Decision making	Business decision making	Student 16	There's also analytic strives everything. I know we're known as a marketing school but I think I was surprised to learn how quantitative all the marketing decisions are.	0.50%
Decision making	Business decision making	Student 7	So things like that, they would probably argue that on sort of an ad hoc basis, transaction innovation was applied, just sort of doing new things in the form or getting the deal done.	0.40%
Decision making	Business decision making	Student 5	not everything can be measured from the empathy side, so that's why you do the qualitative empathy side, and then not everything can be learned just from observation	0.30%
Empathy	More empathic approach	Student 7	it was my job to know a lot about it, but the way I went about it wasn't by, you know, demanding these types of reports or this information or anything like that. It was just asking about, you know, what they were thinking about, what they were worried about, how I might be able to help them.	0.60%
Empathy	More empathic approach	Student 14	I know that there would be some individuals in the Kellogg School that would not really bother with this methodology or care about it at all.	0.40%
Empathy	More empathic approach	Student 7	So, that's one option. Is it not wrong, but simply masking something that we've unearthed that's interesting? And so, to do that between each stage, so if you talk about like a need identification to a brainstorming phase, to a prototyping phase, to a piloting phase, to a design, you know, first product design, and then you iterate that whole loop.	0.70%
Empathy	More empathic approach	Student 14	I talked with them about their Pain Points, on pain points, about the process, and I actually sat and observed them , doing some order entry for about an hour to understand exactly what was important to them	0.60%
Empathy	More empathic approach	Student 12	I think it makes you–it helps drive decisions	0.10%
Empathy	More empathic approach	Student 13	I think people may be a little skeptic going in first if they don't know what value it's going to bring them.	0.40%
Empathy	More empathic approach	Student 15	So you can't just design or make decisions based on that aggregate or the average of everyone. You understand that like it's really going to affect people differently, so you make decisions based on that	0.50%
Empathy	More empathic approach	Student 14	I think anyone that wants to touch any form of marketing and product design, it's absolutely valuable.	0.30%
Empathy	More empathic approach	Student 15	It's–people need to understand it as like a key part of marketing, but they don't necessarily need to master it unless they want to do it.	0.40%
Empathy	More empathic approach	Student 15	everyone struggled on the first round. You just don't understand what you're looking for. And it's especially difficult because you don't know what the end product is. Like you're just doing interviews and you have no idea where it's going.	0.70%
Empathy	More empathic approach	Student 16	Quest at University of Maryland, and so we learned a lot about design- thinking.	0.20%
Empathy	More empathic approach	Student 15	when you talk to someone and like you see that they're in pain like you kind of feel that a little bit. It's not–it's not like you're just logically thinking through what they might be thinking about like part of you is really feeling that and that like seems to be the difference between doing empathetic research and being in the same space as someone and doing a survey or looking at the data	1.10%

Category	Code	Case	Text	% Words
Empathy	More empathic approach	Student 16	we went through another iteration and changed our idea, we didn't exactly know what we were focusing on. So we developed a few games to understand like, there is a problem with spending, but we didn't know what the exact problem was. So we developed a game where we then realized that there are trade-offs students are making. So how do value this social impact from these trade-offs? And how can you quantify them?	1.30%
Empathy	More empathic approach	Student 14	everyone that I've talked to has gotten something out of it and understood the role of it. , and I think most people understand its role within a certain context. Everyone, and not – everyone understands that they may not be in those contexts in their business careers. but it's still important.	0.80%
Empathy	More empathic approach	Student 16	have to get consumer insight before you can go to how would you segment this, how would you position it, how would you do targeting?	0.40%
Empathy	More empathic approach	Student 14	having the empathic design is really great for the initial idea and like creating the big picture ideas	0.30%
Empathy	More empathic approach	Student 17	We did a lot of qualitative research, so things like focus groups, shop-alongs, in-depth interviews, observing how people go about their lives, based on whatever product and project that we were working on, was a huge part of it.	0.40%
Empathy	More empathic approach	Student 7	Because the whole point of doing ethnographic research, in my opinion, is that you're trying to uncover and unearth things that typical quantitative methods won't or can't.	0.30%
Empathy	More empathic approach	Student 17	I was working on for a coffee company, and we went to malls to talk to people who were using the coffee appliances, how they used it, why they used it, why they're at the one that they have chosen to be at. We talked to people who were manning those stations, what they observed. We went to coffee shops to look at what people bought, to observe their behavior at the coffee shops to see, like, whether they were there just to pick up coffee or if they were there to socialize.	1.00%
Empathy	More empathic approach	Student 13	I'm just seeing it from the eyes of a general manager. I'm going to have to be–I'm going to be making decisions that affect a lot of people and I need to understand really what is driving my decisions. And if I can have the hard numbers plus an understanding of how people feel about what they're doing then I can make better decisions.	1.10%
Empathy	More empathic approach	Student 7	the project we had was a very specific facility, just down the street in the community which I lived, with specific individuals so my professional service as empathy started kicking in. And I'm trying to help my clients, and they have very real human problems that I could identify with.	0.50%
Empathy	More empathic approach	Student 17	I would say that, in the Kellogg MBA curriculum, there's not as much of the design thinking and empathy, at least not explicitly taught, in the core curriculum.	0.30%
Empathy	More empathic approach	Student 12	it's like–overall, I would say that understanding the kind of how decisions were made I didn't kind of take that perspective before of, like, what was driving their decisions, and that gave me a better understanding of, like, how we could.	0.40%
Empathy	More empathic approach	Student 12	And so we were trying to figure out a solution to that, and we went into it thinking that we just needed to get all the cyclists onto the road way and that's where they were supposed to be. I mean long story short was that we interviewed a lot of, like, police officers, students, people that ride on the sidewalks, people that ride on the street, pedestrians, and we came away with a much different result than we thought we were going to have. Just because we hadn't considered kind of, like, some of the factors that influence a lot of the decision making in terms of bike riding.	1.10%
Empathy	More empathic approach	Student 17	I think people talk about it and allude to it, but never say it straight up that this is what we're doing, that this is empathic design, that this is the type of research that needs to be conducted in order to truly understand your customer.	0.50%
Empathy	More empathic approach	Student 7	Oh my God, you unearthed something so interesting, but it's simply not going to move the needle for an organization, so let's go back and identify some other, look at the those other needs you identified, which maybe weren't as salient, but by the way, impact 40% of expectant mothers or something. So it could just really help you with each gating decision.	0.70%
Empathy	More empathic approach	Student 11	Still in the end we did not use – even during the entire course, we did not use any sort of data whatsoever. So – but yeah, it did yield it – it did yield us some nice insights on how to solve the problem and –	0.60%
Empathy	More empathic approach	Student 8	I think since our goal, since the goal of the class was mostly focus on desirability, it helps make decisions that maximized desirability.	0.30%

Category	Code	Case	Text	% Words
Empathy	More empathic approach	Student 10	I think you have a far more honest and true answer from whoever you're observing so that's like – I think it's the biggest difference.	0.40%
Empathy	More empathic approach	Student 6	expand the ways I innovate, expanded the caliber of ideas that I think are good	0.20%
Empathy	More empathic approach	Student 17	what it is that's making, that's helping them make their decision.	0.10%
Empathy	More empathic approach	Student 18	I think any time you're trying to innovate or do something that's you know new territory for you as a business, that's where I would put more emphasis this process, right?	0.30%
Empathy	More empathic approach	Student 17	You start by understanding what people want, what's, what they want to change from their current state of being.	0.20%
Empathy	More empathic approach	Student 17	I think it's important to ground your thinking innovation in empathy. I think it's important to go figure out what people actually want, and then build an idea off of that.	0.30%
Empathy	More empathic approach	Student 6	But never did we say, all right, you're the client. Here's what you're going to do. Here's how you're going to feel. We never did that.	0.40%
Empathy	More empathic approach	Student 17	So it was actually, yeah, I mean, that was actually interesting to see that aspect, the right-brain, the soft side come up in what I had anticipated to be a very left brain.	0.40%
Empathy	More empathic approach	Student 18	You know we're told if you study these equations, you'll get an A in math and you'll do well on the GMAT. If you study this vocabulary you will do well on the reading section and it's a lot of times trying to figure out what is a structured approach to get to the right answer, right? You give me the tools, show me how to use them and I'll find the right answer and so this was an exercise in things that are little more ethereal, right? It's – there are certainly techniques but there's not always a right approach, there's not always a right way to get to the answer	1.00%
Empathy	More empathic approach	Student 18	it's a set of protocols but the solution can be a wide array of different things that you discover	0.20%
Empathy	More empathic approach	Student 19	I think when there's an obvious consumer who you can observe, then I think it would be hard to find an instance where increasing your understanding and use of empathic design would not have a positive impact on your decision -making, but in a B-to-BB2B context–kind of business-to-business, when you don't necessarily know who the user is or maybe you do but you can't observe them because of fear of espionage or something, then I don't know whether– you–how much – how well you could use it.	1.20%
Empathy	More empathic approach	Student 6	You need to know what you're looking for. You need to know what are the problems you're solving for.	0.30%
Empathy	More empathic approach	Student 2	spend a lot of time trying to understand the motivations that people have and how those affect their behaviors and how the behaviors affect the outcome	0.60%
Empathy	More empathic approach	Student 2	empathic methods are driven into you as a military leader	0.20%
Empathy	More empathic approach	Student 5	we were actually in the field, interviewing, observing people, and then coming back with our insights	0.20%
Empathy	More empathic approach	Student 2	What is used much more often is the word “trust,” “trust-building leadership,” and you can't build trust without really understanding the people that you're trying to – of whom you're trying to earn the trust.	0.80%
Empathy	More empathic approach	Student 15	if you're going to do anything that's consumer centric, it behooves people to have at least a baseline understanding of what empathetic research and design thinking are and why they're important.	0.50%
Empathy	More empathic approach	Student 15	It's a question of whether or not they think that they can do that just through like data analytics and data science, or can they do it through–or do they need to do it through empathy driven design.	0.60%
Empathy	More empathic approach	Student 5	So I'd say, as long as it's something that can be learned through observation or talking to someone, I think it's highly valuable	0.30%
Empathy	More empathic approach	Student 2	using different methods that – in the MMM curriculum, we're using different methods and we're taking it to a different level,	0.50%
Empathy	More empathic approach	Student 20	hearing those mismatches were interesting and opportunities for us to sort of use as like a springboard for investigation	0.20%

Category	Code	Case	Text	% Words
Empathy	More empathic approach	Student 15	I almost found that marketing was like really similar to design thinking. There was our professor emphasized a lot that if you don't understand the customer first like you're not going to be able to design the product. You're not going to be able to price the product. You're not going to be able to promote the product. So and he actually recommended a lot of the things that are the same recommendations in design thinking, the observational interviews	1.20%
Empathy	More empathic approach	Student 20	well it doesn't map onto the insight, so it doesn't make sense to do it; was very much useful and something that we found – like, that was – it was foundation for us in RDB.	0.50%
Empathy	More empathic approach	Student 21	So using a more qualitative data collection approach, and collecting those stories from the individuals, helped us to give anecdotal indicators of success, when we couldn't really give hard numbers.	0.40%
Empathy	More empathic approach	Student 21	Empathic design led us to better decisions than using no design.	0.10%
Empathy	More empathic approach	Student 5	observing someone and then talking to them	0.10%
Empathy	More empathic approach	Student 22	I mean, for instance, our sales increased by well more than any other sales territory, and a lot of it, I believe, was just using these methods, and also teaching my assistant that, you know, what people, what our clients, our financial advisers that we were selling to, what they cared about.	0.60%
Empathy	More empathic approach	Student 22	I don't think there was any way we could've had data that would have shown us that she had been, you know, scared or intimidated to use these workout machines.	0.40%
Empathy	More empathic approach	Student 22	I would say the vast majority of students would, yes, absolutely, improve their understanding of user needs based on this curriculum.	0.20%
Empathy	More empathic approach	Student 13	I think it could complement a lot of the subjects that we learn.	0.20%
Empathy	More empathic approach	Student 22	I think anybody can follow the process and it gives you a framework for how to, how to approach things	0.20%
Empathy	More empathic approach	Student 13 (part 2)	We wanted to use more of their language. We wanted to highlight maybe some of the stories of the musicians they were supporting. We weren't able to, we weren't able to do that.	3.80%
Empathy	More empathic approach	Student 23	obstacles for me was conducting ethnographic research and making decisions on the basis of one or two or three experiences and I think that it did help us develop some extremely valuable insights that really brought our idea to life and I think the richness of those conversations really was a tremendously important aspect of that class but I found myself constantly questioning whether this was really translatable	0.70%
Empathy	More empathic approach	Student 23	when you're putting something together, you might not necessarily know where it's going or you might not really know which set of users the solution cater itself specifically to and there might be a group of users you didn't expressly design the solution for that find that it's absolutely perfect for their requirements	0.60%
Empathy	More empathic approach	Student 5	And then actually observed her interacting with the kids, and really getting into the field and watching how, you know, the YMCA, everything took place.	0.30%
Empathy	More empathic approach	Student 3	definitely for me, part of being successful was being able to spend some time with each individual that I would ultimately work with or that had an impact on my project, and kind of learn about their goals and where they fit in with the organization and what was important to them and to use that kind of relationship and knowledge to work better with them and theyto get better results.	0.80%
Empathy	More empathic approach	Student 3	I was aware of empathy at thatthe time and using empathy to build better relationships with people and be more effective at work, so. So that was something I was aware of and something that I realizerealized was important, but I certainly didn't have any training using it or any formalized structure around it, so I would say I was rarely confident.	0.70%
Empathy	More empathic approach	Student 3	before we could understand, like, what even was a problem, we had to go out and talk to the students and understand a variety of studentsstudents' kind of pain points and thoughts, and so, you know, qualitative ethnographic research was pretty much the heart of that.	0.50%
Empathy	More empathic approach	Student 11	qualitative empathic design, at the beginning, can give you direction in which you want to proceed, can help you focus on a particular aspect, and sometimes even be complete in itself.	0.40%

Category	Code	Case	Text	% Words
Empathy	More empathic approach	Student 11	So right now when you say we want to innovate, it's a very broad thing. What do we do it on? You don't really know, so you need some guidance, some direction to channelize your energy and your thought process, and this approach would basically tell you.	0.70%
Empathy	More empathic approach	Student 11	it's like you having more facts, more information to make – base your decision on.	0.20%
Empathy	More empathic approach	Student 11	we started off with ethnographic research because we had a fun time doing it during RDB and trying to understand what are the different painpoints of different consumers that US Cellular has, and based on that, we had an idea.	0.60%
Empathy	More empathic approach	Student 3	you need to keep doing it. And each problem is different, each user is. Each user's different, each. Each context that you're working in is different,. I mean, there's notno one size fits it all, and I think that's kind of, like --, what the approach is, basically, based on is that there is no one size fits it all.	0.70%
Empathy	More empathic approach	Student 11	we already had these things in the back of our mind, but rather than belaboring or elaborating more on the consulting framework, we actually went to the Y, talked to the people who were members of the Y, and tried to understand what they liked about the fitness center, what they do not like about the fitness center.	0.80%
Empathy	More empathic approach	Student 10	So when you come and talk about ethnographic research and design thinking and all like those other words, and insights, and all those things, so maybe people don't know what it is but the problem is not that they don't know what those words means, the important part is they don't know that the process exists.	1.00%
Empathy	More empathic approach	Student 4	I didn't know this existed. This was just, again, a gut feel kind of thing that I did	0.30%
Empathy	More empathic approach	Student 10	I think at first you have to show how that tool can be used and especially, for example, in business schools you have to show that it's an effective tool, that people make good use of it before they're like big organizations are making good use of that.	0.80%
Empathy	More empathic approach	Student 4	I think the result of any innovation should be how it will be – how to make the lives, perceived or otherwise, of its users better, and empathy is always one step closer to that end result than what numbers are.	0.70%
Empathy	More empathic approach	Student 10	for me it was like a great revelation of how much you can learn just from seeing a small group of people, behavior, talking to them, and just observing them	0.50%
Empathy	More empathic approach	Student 1	And the answer quantitatively is no. But through discussion, the answer, for the individual person making the decision, is yes,	0.30%
Empathy	More empathic approach	Student 1	realize the struggle people went through every day to manage their information.	0.20%
Empathy	More empathic approach	Student 4	The way I approach it is it's almost both at the same time and bouncing off each other. So you start talking to somebody, you have an interview with them, and you get a semi-insight of them. The, and the next thing I'dI do is, “I wonder if this can be expanded?” So you go back and you do a few Google searches and see if this is a trend. Now you have the data; the. The next interview you go into, you're like, “Let me see if an – you know, this similar trend crops up.”	1.70%
Empathy	More empathic approach	Student 2	using different methods that – in the MMM curriculum, we're using different methods and we're taking it to a different level	0.50%
Empathy	More empathic approach	Student 4	I did not know that [emphatic]empathic design could have a use in the business world, because almost everything you're geared towards is numbers akin, but. But now, it is clear that you need both.	0.60%
Empathy	More empathic approach	Student 2	like really, deeply trying to understand what people need by observing them, by making mistakes and learning from that, and –	0.40%
Empathy	More empathic approach	Student 21	I think in most roles, it can definitely make innovation more well-rounded.	0.20%
Empathy	More empathic approach	Student 12	I feel like you can dovetail it with almost every course that we've taken. Like, you could easily dovetail it with strategy. Easily dovetail it with marketing. Even like finance, like, because, like, finance one is a little bit more, like, about just time value of money, but finance two is all about, like, how a firm makes decisions. Like that right there is all about empathy, because you, you know, it's your shareholders or whatever. So, yeah. I just feel like if there was more, rather than just being like, hey, guys, here's like an, like a user-centered design class, if it was kind of like throughout, that it might–it's like you're giving them their vitamins without actually like knowing it.	1.30%

Category	Code	Case	Text	% Words
Empathy	More empathic approach	Student 18	So maybe in that sense you know with business leaders to keep all that in mind when they're creating their internal structures that motivate their employees, you know, how can we make sure it's not only good for the business but also great for our customers and great for society at large.	0.40%
Empathy	More empathic approach	Student 6	Because, I just don't think, I think I knew about the idea of it. I'd always read about things like IDEO, but I didn't know how it looked, what it looked like in practice.	0.50%
Empathy	More empathic approach	Student 5	So we filmed a lot of our interactions and observations, and even, if you didn't initially see something, going back and watching it, I think, was what uncovered the most.	0.40%
Empathy	More empathic approach	Student 15	I think the important point is that people have to buy into it,	0.20%
Empathy	More empathic approach	Student 18	I think in a world of unlimited funding, you know, it would've been great to spend more time developing what we thought would be the ideal solution in using those sort of empathic methods to kind of drive that. As it was we were very reactionary based on what the customers were telling us we needed to fix and then it was only at that point that we got to kind of employ this you know user empathy model of, okay, well, you say there's an issue, tell me about it in more detail. So I think we were very good at understanding their concerns once they raised them but not as good at kind of proactively addressing those concerns.	1.00%
Empathy	More empathic approach	Student 12	and that's kind of like the softer touch that's required, a lot of times, in developing countries.	0.20%
Empathy	More empathic approach	Student 12	we developed like really great training materials that were totally new, like really well received, but it was kind of like taking that iterative process of my background with local context to develop, like, very collaborative materials.	0.40%
Empathy	More empathic approach	Student 23	packaging it in a way that's accessible to the business school mindset is probably the biggest challenge.	0.20%
Empathy	More empathic approach	Student 8	I think that it prevented us from going down the wrong path in thinking – when we were thinking of like the business lens and something like that it would always kind of pull us back to the user and make sure that that was always the first criteria before we would go too far down the road like what would make more sense from a business perspective.	1.00%
Empathy	More empathic approach	Student 16	they are just coming up with solutions but they're not understanding what the problem is.	0.30%
Empathy	More empathic approach	Student 10	why we are thinking about things that maybe we'll never be able to implement in real life. So yeah, definitely, you have to put a more strong emphasis on the feasibility part to get their attention.	0.60%
Empathy	More empathic approach	Student 9 (part 2)	would have been able to like, uncover more insights. Had we talked to people more, we'd be able to see patterns and trends or just have that “aha moment” that you have trying to be creative.	1.60%
Empathy	More empathic approach	Student 5	so you have to make friends with them, and they have, like, the right people that you find, talk to the supervisors and ask who's the best person	0.30%
Empathy	More empathic approach	Student 13	I mean qualitative will help you understand what is your emotional attachment to a water bottle, or water bottle like this.	0.30%
Identifying needs	Identifying user needs	Student 22	because he had been in sales, that you have to figure out what the customer wants to be able to speak the language.	0.30%
Identifying needs	Identifying user needs	Student 14	So my job would be to interface with the customers, understand their requirements for the solutions, translate these requirements, and then manage the implementation of the project.	0.40%
Identifying needs	Identifying user needs	Student 22	it didn't sell at all. And, the reason was because they didn't have, they didn't check with our customers, which were the financial advisers as to, would you sell it? They just thought it would work, because it seemed good on paper. And so we basically disbanded the product in one year	0.60%
Identifying needs	Identifying user needs	Student 11	So going through this exercise knowing what the customers really value is a key thing that might be very helpful in the decision making process.	0.40%
Identifying needs	Identifying user needs	Student 13	we implemented a survey, gathered feedback on what people thought of the company, what people thought about the values, what activities they enjoy, what activities they saw in other companies that maybe they didn't see there. So, we used that as a way to come up with recommendations to the CEO.	0.80%
Identifying needs	Identifying user needs	Student 6	And that was a combination of the highly analytical building the trades, a lot of detail orientation, as well as a lot of client interfacing, a lot of diagnosing what clients' needs were	0.40%
Identifying needs	Identifying user needs	Student 3	Maybe you didn't really know the right questions to ask andor they weren't very open and honest, so it wasn't always super effective, at least in my experience.	0.30%

Category	Code	Case	Text	% Words
Identifying needs	Identifying user needs	Student 17	So it helps us understand what drives them. It helps us understand, like, what makes them angry about the process.	0.20%
Identifying needs	Identifying user needs	Student 1	are they skaters in California who like Mountain Dew? Or are they, you know, moms in Boston who have a carriage? Like, you just kind of, like, understand who these users are and then how to best curtail a product towards them, but there's no research activity.	0.70%
Identifying needs	Identifying user needs	Student 5	if they know that you're trying to come collect data from them, it makes them nervous because a lot of times, with a big system coming in, it means layoffs. And so, it's like they almost don't want to give you the trade secrets	0.60%
Identifying needs	Identifying user needs	Student 17	On the quantitative side, we would launch a lot of surveys, international, domestic, to see how an even larger group of people responded and reacted to our ideas.	0.30%
Identifying needs	Identifying user needs	Student 19	when making those, yeah, I definitely considered what would make it easier for someone to use or what kind of things that person might want to do, like what kind of questions they might be asking and answers they would be seeking and whether it was worth it to build in a feature to do that kind of thing.	0.70%
Identifying needs	Identifying user needs	Student 12	if you want to have adoption of your solution, like, you have to understand what the end user wants	0.20%
Identifying needs	Identifying user needs	Student 17	So we, or I, like set the objectives of the research, and really worked with my team to go figure out what it is that need to test, and what it is that we need to understand from the people that we're going out to, because research is expensive, right?	0.50%
Identifying needs	Identifying user needs	Student 16	I think there is a lot of value to data-driven analysis. Sometimes, you can understand the problem and hear what the customers are saying. But sometimes, they don't really understand their problem. And data can give you insight that otherwise humans can't give you. It might not always be right but you can see like there is a cluster of points in this one location. And nobody has been hitting on that. You can have a deeper dive and really dig in on that. And sometimes, verbal conversation can't give you that.	1.60%
Identifying needs	Identifying user needs	Student 16	I guess it was mainly understanding the problems of my client. And then developing solutions to the client, for the client.	0.40%
Identifying needs	Identifying user needs	Student 9	I would just try to figure out what could I take from certain people and kind of like integrate it in a process.	0.40%
Identifying needs	Identifying user needs	Student 11	job of understanding what the market requirements were in coordination with our customers.	0.20%
Identifying needs	Identifying user needs	Student 8	I conducted a lot of interviews with clients and with our clients' customers, all with the goal of trying to understand what they were thinking and what they were saying.	0.50%
Identifying needs	Identifying user needs	Student 2	you'd go through some sort of data collection process, you would get feedback from people who are technical experts on whatever it is,	0.50%
Identifying needs	Identifying user needs	Student 6	A lot of times, you've got a client, who isn't really sure about what their risk tolerance is, or isn't sure about what their future plan is and what their strategy is. So for me, a lot of what I was doing was trying to help them figure that part out.	0.70%
Identifying needs	Identifying user needs	Student 16	I mean you'd just go in and ask the client what they want, and figure out how to use it. We had data but I don't know how much of our solution was data-driven. I think it was kind of, 'this is an idea we have, and we're just going to do it.' And hopefully you like it.	1.10%
Identifying needs	Identifying user needs	Student 5	marketing teaches you the basics of marketing, and how to look at a market and see, figure out your target market, and the key ways to reach your target market	0.40%
Identifying needs	Identifying user needs	Student 11	what the end-user wants to see, why do they want to see that and based on that, what should I do right now that'll meet that particular aspect?	0.40%
Language	Language of design	Student 19	If you were in a small group of very traditional business orthodox folks who didn't appreciate it, then maybe it would be a disadvantage if you try and bring it up. Then, and then you would lose–they would no longer see you as one of them	0.60%
Language	Language of design	Student 3	You know, ultimately, it should just be about coming up with the best solution for the userusers. And, if there is this approach, and it involves the language of design, and it involves qualitative empathic thinking and methods, then everybody should use them and thatit shouldn't be like Ia have and have not. It should just be a part of the way that businesses understand that this is the right way to go about solving problems, and thento coming up with good innovative solutions.	1.00%

Category	Code	Case	Text	% Words
Language	Language of design	Student 13	I mean maybe they don't use the word framework, but they are following those steps	0.20%
Language	Language of design	Student 14	As for the language of design, again, I couldn't define what the language of design is. I could define the process that we went through and I could define the aspects of that.	0.60%
Language	Language of design	Student 3	it is important to understand and speak the language, but I wish it didn't have to be a separate language. I wish that it could just be a part of the way that people solve problems in an innovative way.	0.50%
Language	Language of design	Student 1	be able to speak with somebody and relate to them, and then build the logic of their process, is important,	0.30%
Language	Language of design	Student 1	where you're maybe doing growth strategy or product fit, that directly involves product or services	0.20%
Language	Language of design	Student 7	You know, as a former engineer and mathematician, with a sort of a rigorous operational experience, and then coming out of a highly analytical private equity world, with a very clear set of where I thought I wanted to go, you know, it was kind of like what is this fluffy bullshit I have to take? What is this empathy-driven blah, blah, blah. It feels like, "Oh my gosh. We're going to sit down and hold the hand of a lactating mother and it's going to help me do what exactly?"	1.00%
Language	Language of design	Student 21	I think what's more important is being able to translate between the two worlds, while they increasingly merge. And I think it goes back to the communication piece that we talked about, but explaining what design means, beyond sort of these outdated modes of-	0.60%
Language	Language of design	Student 14	if you're talking a lot of the vocabulary and jargon that is used by designers, I would say “rarely”, and only in the context where you need to directly communicate with designers.	0.50%
Language	Language of design	Student 15	I guess it's important to speak the language and understand the purpose, or else you won't be doing anything effective at all	0.30%
Language	Language of design	Student 17	the language of design just represents, like, any kind of cross-functional team to me.	0.20%
Language	Language of design	Student 5	people have this hindrance when they hear the word design, a lot of times, coming, you know, from like a very structured engineer. Like, I love being creative in that side, but I am always nervous to say, you know, I, anything with design, because I know that there's better people, people who are better out there.	0.70%
Language	Language of design	Student 7	And they feel like, oh gosh, here's this is newfangled latest and greatest innovation tried to be practiced on me and they get, they don't even care what it is. They're just going to be, like, roll their eyes, and kind of puke all over it. Whereas if you produce, you know, deliver it in the terms that they're comfortable with, suddenly they think, "Oh, man. That [NAME] guy, he did, really, you know, really unique way of looking at our business issue and uncovered a lot of really interesting things" So I think the language of design is less important than the principles in practices of design, but, my two cents.	1.20%
Language	Language of design	Student 7	I think equally important, if not more important, is learning how to practice the principles of design but learn to speak it as a, call it like, a normal citizen, you know what I mean? You're in a corporation. You're in a business. You're in a whatever organization. You're in the government. What's most important is that you practice the principles. What's less important is that you use the proper lingo in delivering it	0.80%
Language	Language of design	Student 3	Like, it can seem very, kind of, fluffy and non-structured and all this design thinking methodology	0.20%
Language	Language of design	Student 3	I think it was kind of just, like, branded differently. I think it was branded more of, you know, personal relationship building, which definitely	0.30%
Language	Language of design	Student 6	if I went back to my last organization and said, well, let's do empathic design here. They'd kind of like laugh at me and say, what is that?	0.40%
Language	Language of design	Student 13	I think that the connotation sometimes is–I don't want to be a designer in the sense of creating cool graphics and things that look pretty. But I don't think that's what this is. I mean if there was another word that could–we use it on design engineering. In design engineering, you're not making things pretty. You're making things functional. And if you can make them aesthetically pleasing, okay. But if they're functional	1.20%
Language	Language of design	Student 3	I wasn't personally aware that I was using these methods because I didn't know what they were; I had no definition of them	0.30%

Category	Code	Case	Text	% Words
Language	Language of design	Student 17	But, if you can speak in the language of design or engineering, whatever this is, and relate to them? Then, you can, you form an ally, right? Like, you form a collaboration where both party's needs are addressed. And if you can explain it in a way that resonates with them, then your business, or your idea, your project, or whatever it is that you're working on, can go that much further.	0.80%
Language	Language of design	Student 5	I'd never heard the term ethnography before coming here.	0.10%
Language	Language of design	Student 23	the concepts, I feel, are very important but I think the language of design creates a barrier in the sense that it creates an illusion that it's something that is less excisable than it really is.	0.40%
Language	Language of design	Student 23	I think that having specific definitions might actually restrict the way in which those organizations put the practice into place and might make it even less accessible if it's intimidating from a language perspective.	0.40%
Language	Language of design	Student 23	It's not fuzzy in the application or the motivation behind those words. So I think the motivation behind those words are absolutely correct and those are principles that should be taught	0.30%
Language	Language of design	Student 20	language of design in business, I think, is kind of vague	0.10%
Language	Language of design	Student 21	people have very outdated notions of what “design” is.	0.10%
Language	Language of design	Student 6	I think if I'm working with the people who took the course, we all speak the same language, so it's just going to be inherently easier for us to develop a solution, versus someone who hasn't taken the course who may not understand all the concepts and may be like, why are we going in circles here?	0.80%
Language	Language of design	Student 16	design-talk is. I kind of just shut down because I'm not sure what it's saying and maybe people who are like you understand you. But people like me have no idea what you're saying. It just sounds fluffy."	0.70%
Language	Language of design	Student 20	it's not a well-known space and it's not a well-known space when you use those terms	0.30%
Language	Language of design	Student 20	I think it's less about speaking the language and more understanding the approach and practicing the tactics.	0.20%
Language	Language of design	Student 16	as designers, we understand what we're saying, but if we can't communicate with the outside world, that's where it stops. So I think it's important to figure out a way to bridge that gap so that we can reach more people.	0.80%
Language	Language of design	Student 20	issue is design as a process as opposed to design as a tangible output.	0.20%
Language	Language of design	Student 22	I think creativity would never have a negative, I don't think it would have much of a negative connotation. But, as far as the fuzziness, the soft and fuzzy feeling, it's something that really would need to be avoided in a lot of business contexts.	0.50%
Language	Language of design	Student 14	I couldn't even articulate what the language of design is.	0.20%
Language	Language of design	Student 5	Understanding and being able to re-communicate, because I think, in business, a lot of times, there's these buzz words, but, like we learned in strategy. Like, synergy, but, you know, many times it's misused and I think that as long as a person can explain design and empathetic design, that it is very valuable	0.70%
Language	Language of design	Student 10	I think the language of design is still not a reality for everybody. A lot of people don't really understand and they don't even know what it is so it is important for everybody but people are not there yet.	0.70%
Language	Language of design	Student 12	And it's in there and not labeled as like a user centered approach.	0.10%
Language	Language of design	Student 5	initially, being able to speak the language in official words is key, and then what kind of persists long-term is really being able to break it down into layman's terms.	0.40%
Language	Language of design	Student 12	I mean it's there every day in business and I think it's totally part of the language because that's like how people make decisions. But, right. I think that it's just-it's in there, but maybe not labeled as design	0.50%
Language	Language of design	Student 2	being able to speak the language of design and business will always be important in the future	0.40%
Language	Language of design	Student 22	I think that really hit home with them, but if I'd talked about design, it had, that design thinking name hasn't filtered in, or hasn't gotten through to that particular sector.	0.40%
Language	Language of design	Student 13	I think they're like buzz words that are used too much in general	0.20%
Language	Language of design	Student 4	Being able to speak and appreciate the effort that goes on behind it and understand it would be important to me. I wouldn't want to think that when someone comes up with [emphatic]empathic research results, that this is wishy-washy, and not important enough.	0.80%

Category	Code	Case	Text	% Words
Language	Language of design	Student 22	I think, the content is absolutely important, being able to understand the language of business, but not necessarily use the, it depends on how literal we're being.	0.30%
Language	Language of design	Student 4	It's important to understand it, for sure. How well you speak it, I think that's – that goes in hand with your preferences and attitude, but it is definitely important to understand and…--	0.60%
Language	Language of design	Student 1	framing what you see what the business doing, in terms of what the tangible product output will be and you need to be able to speak the language of design to certain designers to get the results you want.	0.60%
Language	Language of design	Student 12	And, so, like for me, like, going into it, I'm like, oh, Jesus, are we just going to be using like Kumbaya and, like, hand holding, and like doing all of that.	0.30%
Language	Language of design	Student 12	But maybe it seems like elitist and not attainable to some people. That it's like–it's harder for them to–that it's not some–it's like, well, I can't do design.	0.40%
Language	Language of design	Student 6	Because, I just don't think, I think I knew about the idea of it. I'd always read about things like IDEO, but I didn't know how it looked, what it looked like in practice.	0.50%
Language	Language of design	Student 21	you hear the word fluffy a lot. You hear the word non-essential.	0.20%
Language	Language of design	Student 9 (part 2)	It just depends on what the business objective is. If it's pure numbers, then you probably wouldn't need much empathy or design understanding. Numbers are numbers, they don't change; 2+2 will always be 4, but if it's something more nuanced or if you're in the industry where it's highly competitive, then that could be – being able to understand design could be your competitive edge	3.00%
Leader	A better leader	Student 5	MORS class. It's a management and organizations, and one of the things we learned in the class is establishing a culture is very key to the success of your business.	0.40%
Leader	A better leader	Student 5	I felted that with an engineering undergrad that it could get me to the next level. And then I knew I would always go back for like an MBA. I felt like, it almost gave me a step up against people who just had a business degree, because it was a little more academically rigorous.	0.70%
Leader	A better leader	Student 18	I think there's a lot of people at certainly Kellogg and kind of in our generation that trying to think about you know how can we as business leaders make decisions that are not only great for ourselves, great for our companies, but also focused on kind of the larger picture, right?	0.40%
Leader	A better leader	Student 21	I think it's important for any leader to have empathy for both the people that they're managing and the people that they're serving. So much of business is relationships	0.40%
Leader	A better leader	Student 7	You get a rhythm and an academic experience and a work experience that's now satisfactory to you, then you could take a step back to say, "What is that I want to do?" So that's what business school provided.	0.40%
Leader	A better leader	Student 4	The MORs courses that I've taken, and am taking, are helping me grow as an individual, and as a leader, making me more aware of myself, my self-reflections, or of how you communicate better with the person on the other end of the table and how you recognize him	0.90%
Leader	A better leader	Student 1	understanding what different biases people might have and how to get around those biases when leading groups.	0.20%
Leader	A better leader	Student 1	business leader perspective, you gotta understand that to hopefully align different people's incentives properly in your own organization.	0.30%
Leader	A better leader	Student 1	what you need as a leader. And that's where, you know, the language of design kind of crosses that boundary.	0.30%
Leader	A better leader	Student 17	the ones who never lose sight of the people that they're trying to deliver products or experiences to.	0.20%
Leader	A better leader	Student 17	I think it's even, it might be even more important for us starting out, us, meaning non-CEO leaders right now, to understand customers and understand the people that we're trying to serve and address.	0.40%
Leader	A better leader	Student 7	So getting my MBA allowed me to take finance classes that I could have a focus on energy or energy policy classes and re-package myself as an energy-investing professional.	0.30%
Leader	A better leader	Student 13	I didn't have the hard tools that were needed to become a general manager.	0.20%

Category	Code	Case	Text	% Words
Leader	A better leader	Student 1	Being able to understand who is leading an organization that you may be competing with, or who you're trying to sell to, and to be able to craft the business solution, or your attack vector properly, is a big, you know, a really big, would be a big advantage.	0.70%
Leader	A better leader	Student 12	a lot of businesses are about how do you influence without authority? How do you work cross functionally	0.20%
Leader	A better leader	Student 23	I think my dad is a great leader in this organization and he's very much an empathic leader in the sense that he goes to great extents to get an understanding of the level of happiness within his organization and getting an understanding on what people's motivations are	0.50%
Leader	A better leader	Student 6	I think that that's going to really have changed the way I look at problems, the way I look at solutions, and the way I kind of chart both my career and my potential, you know, whatever company I'm working at.	0.60%
Leader	A better leader	Student 12	at the time, I was like supervising employees. I kind of had that some of that, like, practical leadership experience, but I really wanted to kind of formalize some of that training and formalize maybe–and get a better idea of how to be a better leader, how to improve some of the soft skills	0.60%
Leader	A better leader	Student 9	I know some of the smartest people who can't, who they're their own worst enemy. They don't know how to communicate or navigate these professional organizations for their own career success	0.60%
Leader	A better leader	Student 23	I think from a leadership standpoint, developing those personal leadership insights I think makes you feel a lot more invested in coming up with something that's really, really impactful	0.30%
Leader	A better leader	Student 3	I thought that it would kind of make me more incrediblecredible and also give me some of the more skills that would enable me to lead bigger thingsteams through harder problems	0.30%
Leader	A better leader	Student 23	I feel that I benefit from being self-reflective about it and I think an empathic design approach while it might seem obvious gives you the opportunity to reflect on the exact things that you're doing to become a better leader or make better decisions.	0.50%
Meaningful	More meaningful solution	Student 9 (part 2)	but if you have something that's more nuanced, then yes, you will – want to understand how what you're designing affects everybody in the process.	1.10%
Meaningful	More meaningful solution	Student 12	in our case for the project that we developed, like, the solution we would've come up with would've been, like, probably not as well received, and probably not as like–we would have just taken our own perspective and been like, okay, well, here's the issue. Here's how we see it. This is, like, what the problem is, and here's how we need to fix it. Whereas the end result that we came up with, I think, brought together a middle ground that a lot of people could accept and be on board with	1.00%
Meaningful	More meaningful solution	Student 7	what they were thinking about, what they were worried about, how I might be able to help them.	0.20%
Meaningful	More meaningful solution	Student 12	unless you, like, actually have talked to them and understand, like, what it is is actually driving their preferences, like, there's–I mean you could end up on a completely different path that makes absolutely no sense.	0.40%
Meaningful	More meaningful solution	Student 15	I think the main reason they were better was they forced us to think about–to think about solutions on like an individual level and really understand the different needs of different people.	0.50%
Meaningful	More meaningful solution	Student 5	And even going back and watching it with other team members, because one person would see something and point it out and then you'd start recognizing other similar things	0.40%
Meaningful	More meaningful solution	Student 18	That was something we were completely blind to going in and it ended up becoming a core part of the solution that we proposed.	0.20%
Meaningful	More meaningful solution	Student 22	I think we would have gone in the right direction with the typical, you know, framework that you would get in strategy class, for instance, but we wouldn't have had that additional element that led us to our final solution and, or, our final solution wouldn't have been as, you know, robust without it.	0.70%
Meaningful	More meaningful solution	Student 18	I saw results come out of that process that we would not have done – we would not have gotten had I been using my traditional approach to kind of solving these problems.	0.30%
Meaningful	More meaningful solution	Student 11	you still need to have the empathic thinking, empathic design approach in your toolkit because it can help you unearth some valued insights.	0.30%

Category	Code	Case	Text	% Words
Meaningful	More meaningful solution	Student 15	Because you can get at the root of what is important to that person which I think can bring a lot more value to customers, ultimately.	0.40%
Meaningful	More meaningful solution	Student 3	But, you know, once we'vewe got to the YMCA and talked to all the people there and, then we were able to shape a better solution for	0.30%
Meaningful	More meaningful solution	Student 18	you need to understand what the data says, you need to be able to interpret that but ultimately your goal is to please the customer with your product or process and that – yeah, you really got to combine those two to make sure that the decisions you're making based on you know if the data informs you where to look or on what to do to make sure that ultimately it's addressing the needs of those who are paying you to do whatever you're doing.	0.70%
Meaningful	More meaningful solution	Student 21	So I think, you know, being on the ground, with users understanding what their issues are and the business opportunities there, and then checking in with the data to say, does this represent a sizable opportunity? And if so where? I think that the combination of those two leads to really meaningful, monetizeable solutions.	0.70%
Meaningful	More meaningful solution	Student 21	I think that empathetic design helps you to actually understand what the needs are and then create a product that's both profitable for the company and serves the end user.	0.40%
Meaningful	More meaningful solution	Student 13 (part 2)	by not having the qualitative aspect of it, our solution was a little more generic than we would have liked it to be.	2.50%
Meaningful	More meaningful solution	Student 13 (part 2)	the same approach that we took, and the same recommendations that we wrote could be applied to any organization that goes and asks for fundraising. We wanted to make it more specific to them.	3.70%
Meaningful	More meaningful solution	Student 21	I think it helped us to serve the parents and the families in the communities better, because it gave us a better understanding of what the actual challenges were	0.40%
Meaningful	More meaningful solution	Student 18	in my previous job, we were doing some of this empathic design thinking stuff but we could've done a lot better job at executing it had we known some of the techniques and ways to really get to the core of what the users problems were.	0.40%
Meaningful	More meaningful solution	Student 18	So the better you can understand what the issue is, the better decision you can make in terms of what you need to create.	0.20%
Meaningful	More meaningful solution	Student 13	we needed to understand that mission in order to come up with good solutions and good recommendations for them.	0.30%
Meaningful	More meaningful solution	Student 20	I would guess that having a real handle on the issues that these customers are facing or the pain points that they have, I guess that that would increase the likelihood that you're able to provide or come up with a solution that is useful to them or meaningful to them.	0.70%
Meaningful	More meaningful solution	Student 16	making decisions when you base them off of understanding your customers, gets you to the right solution.	0.30%
Meaningful	More meaningful solution	Student 8	qualitative can be really valuable in building and figuring out exactly what those needs might be.	0.20%
Meaningful	More meaningful solution	Student 20	by having these conversations and incorporating them into the like, design process, you're having the opportunity to create solutions that are maybe more desirable and feasible because you're having the client talk about how their internal structure is or you're talking about what they think some of the barriers are independent of the actual problem you're trying to solve	0.80%
Meaningful	More meaningful solution	Student 13	I think emotional response is a good thing either simply by just looking at employee engagement and how employee engagement and job satisfaction. That could be one way to look at it, but I think it will drive you to design a better product or service or whatever it is your company does.	0.80%
Meaningful	More meaningful solution	Student 13	You see it from there are all these schools of thought on doing it a certain way with surveys and being very quantitatively driven, statistically driven. If you compare that with an anecdotal or ethnographic research, basically, it lets be closer to your customer or user or whoever you're studying. You can usually find a marriage between the two that will give you really good results.	1.00%
Meaningful	More meaningful solution	Student 2	in business today, where consumers are demanding products that are simpler, more meaningful, that – for you to really drive innovation, then you have to be able to speak the language of innovation, and so that's why we're here.	0.90%

Category	Code	Case	Text	% Words
Meaningful	More meaningful solution	Student 16	we have won so many of them. We always just laugh because really, when is everybody else going to catch on that everybody's solution is like empathy driven designs solution,	0.50%
Meaningful	More meaningful solution	Student 4	there's much more to users than the prompt or the question or even the data you're given.	0.30%
Meaningful	More meaningful solution	Student 6	I think almost always it's going to lead to a more informed decision.	0.20%
Meaningful	More meaningful solution	Student 14	I think a qualitative, empathic design process is very good at coming up with new ideas and understanding like, gaps and white spaces.	0.40%
Meaningful	More meaningful solution	Student 1	through interviews of the client, we got to see how big a problem it was, And but how necessary it was to possibly solve it	0.40%
Meaningful	More meaningful solution	Student 7	when you're in an intimate interaction with the specific demographic you're wanting to derive insights from, it's almost impossible not to get a more empathic understanding	0.30%
Meaningful	More meaningful solution	Student 14	I think for two reasons; one because there were certain insights that we got out of the ethnographic process that we wouldn't have had otherwise, or we might have speculated on them but not have been able to go with.	0.70%
Meaningful	More meaningful solution	Student 14	I don't think I realized it until after the fact --, but the fact that I used the empathic methods actually made the solution much, much stronger.	0.40%
Meaningful	More meaningful solution	Student 5	So I'd say, as long as it's something that can be learned through observation or talking to someone, I think it's highly valuable, and can not only lead to, like, a better process, but like more efficient process in the long run.	0.50%
Meaningful	More meaningful solution	Student 7	By all means, lean on the quantitative data, when and if it makes sense, but it should always be a complement to, at each stage of the innovation process, qualitative empathic ethnographic design-focused approach.	0.40%
Meaningful	More meaningful solution	Student 1	I think quantitative data will get you partly there, assuming you have the data available. Because you may not always be measuring certain things that people are doing outside of the scope of your metrics. But if you put the two together, and you can see, you can see the user in context using the system, you can look at what things they're doing and measure those things. You can kind of come up with this optimized solution.	1.10%
Meaningful	More meaningful solution	Student 12	It helps–or it helps–it maybe instead of just taking, this has been done before or this is what our competitor is doing and makes you think about things maybe a little bit–a bit differently in terms of what's sort of behind the scenes and maybe what is driving a lot of decision making.	0.60%
Meaningful	More meaningful solution	Student 2	you can produce a crappy statistical model if you sort of don't have any empathy,	0.40%
Meaningful	More meaningful solution	Student 16	I think it's important to really understand your users needs before you develop a solution for them.	0.30%
Meaningful	More meaningful solution	Student 1	practicing and doing repetitions, you can find your stride and a way to, kind of, probe around the problem, or talk to a user, understand if that information is valuable, and use it or move on. And how to, kind of, keep curtailing your research to get better and better data and better and better insights.	0.80%
Meaningful	More meaningful solution	Student 2	that taken together they always produce a more meaningful innovative solution. I don't think they're always taken together in the same quantities though	0.60%
Meaningful	More meaningful solution	Student 3	empathic design, people would definitely be cool to have a base foundation of that to, kind of, just set the stage and say, you know, "There is more ways to think about problems than just the core business school MBA curriculum, and there have been empassmentsadvancements in this field and.	0.60%
Meaningful	More meaningful solution	Student 13	it is by following this design thinking process paired with maybe hard numbers.	0.20%
Meaningful	More meaningful solution	Student 2	I think that it can kind of produce a more nuanced insight as well and that in the end if you're doing it right, it would lead to a better product or service.	0.80%
Meaningful	More meaningful solution	Student 7	But, for me, it was very difficult not to then, sort of, feel that empathy and then follow it as I was sort of instructed to and follow different methods and guidelines that we had and come up with some really creative ideas and then see how those ideas actually had a lot of legs and how, if we had done, come at it from a different angle, we wouldn't have done that.	0.80%
Meaningful	More meaningful solution	Student 10	observing people made us understand better what we were trying to do and if we are like whatever decision we were taking will be impactful or not so I think, yeah, it's always is the answer.	0.60%
Meaningful	More meaningful solution	Student 5	I really enjoyed it, because I felt like I could deliver better work,	0.20%

Category	Code	Case	Text	% Words
Meaningful	More meaningful solution	Student 3	combining both of those, kind of, thoughts and pieces of, like, data and insights together, we definitely had more a meaningful solution and a more meaningful understanding of what was happening.	0.30%
Meaningful	More meaningful solution	Student 10	Always especially because if you're talking about end-users, we do the design thinking, we use real users to help us understand the process or get better or whatever we're doing so especially now when we're talking about the solution for end-users, yeah	0.80%
Meaningful	More meaningful solution	Student 22	I believed in the idea. It was something that was simple, yet would have been very effective had it been implemented.	0.20%
Meaningful	More meaningful solution	Student 1	to understand what that user's incentives is kind of yields big insight into what this firm might actually do from a financial and capital perspective.	0.40%
Meaningful	More meaningful solution	Student 3	So that you can have the strongest understanding of it, so that you can come up with the best solutionsolutions.	0.20%
Meaningful	More meaningful solution	Student 8	the user and make sure that that was always the first criteria	0.20%
Meaningful	More meaningful solution	Student 9 (part 2)	you have the opportunity to really understand the problem you're solving and how that affects the people who use the product or use the solution you come up with.	1.30%
Meaningful	More meaningful solution	Student 5	So using the frameworks to uncover insights and different lenses to look at the videos that we had were very key to helping us come to a decision.	0.30%
Meaningful	More meaningful solution	Student 23	we bring the operators over to our facility and actually test the machine with our testing team. So this was something that the client really liked because you got sort of training off their dime because they can do it while it was still not fully built. That always made it really interesting because that was the best feedback that we could possibly get because there were still sort of electronic changes that you could make in the last few weeks and you gave the operators the sense that they were also a part of this building process which is something that they were really excited about.	1.10%
Meaningful	More meaningful solution	Student 12	I will be a business leader and my decisions will have impact on society, and so you hope that, like, because my decisions have impact on society that I'd actually take the perspective of what is best for society into my decision making.	0.40%
Meaningful	More meaningful solution	Student 20	in order to come up with the solutions and innovations that are most desirable to users, I think more of that will come from like, the qualitative	0.40%
Meaningful	More meaningful solution	Student 5	when you get face to face with someone, it's a lot different, and that's, you know, in the business world, face to face, I think a person is more open to you, more trusting of you.	0.50%
Meaningful	More meaningful solution	Student 4	Better solutions that are in line with what the judges/clients want to see.	0.20%
Meaningful	More meaningful solution	Student 4	Because once you get to know the user and what he or she wants, you can design a much better solution that will work with what he or she wants.	0.50%
Meaningful	More meaningful solution	Student 7	So from a transactional perspective, we had to be quite creative around guaranteeing certain employment contracts and getting the purchaser which was this huge conglomerate to sign up to those agreements, in order for the owner and founder to be comfortable selling that.	0.40%
Meaningful	More meaningful solution	Student 1	if you teach the theory behind empathic design, you teach the method, and then you allow people to go practice, that would be an effective teaching path.	0.40%
Meaningful	More meaningful solution	Student 6	I think anytime you're making a decision, whether you're thinking about your employees, your company, the competitors, if you're putting yourself in other people's shoes, whoever those people are, I think you make, maybe not better decisions, but at least a more informed decision.	0.60%
Meaningful	More meaningful solution	Student 11	you can have a bigger set of information base on which you can make a decision.	0.20%
Meaningful	More meaningful solution	Student 16	it gives you more insight	0.10%
Meaningful	More meaningful solution	Student 8	I think the biggest value is that it's the type of thing that people think they are doing correctly when they're not and they don't have any idea that they're like asking the wrong question, they're asking leading questions and not drawing the right insights and – I think kind of that combined with what we learned in our first MORS class which was a lot of about like decision making and seeking confirmation rather than being like dis-confirming information	1.30%
Meaningful	More meaningful solution	Student 11	When we started talking to such people, they started complaining about the biking problem, the bike parking problem at the university. That was a good insight for us because initially, we had – we were not even imagining of such a problem to exist, but when we started talking to people, it surfaced as a good problem that everyone wants us to solve.	0.90%

Category	Code	Case	Text	% Words
Meaningful	More meaningful solution	Student 3	once we actually did the research and talked to the users, then everything we did seemed more grounded in reality.	0.20%
Meaningful	More meaningful solution	Student 8	then we used tools we got much better insights and we talked a lot less, they talked a lot more	0.30%
Meaningful	More meaningful solution	Student 6	Otherwise, you have this, you could have a ten-thousand word questionnaire and you have no idea of what to make of it.	0.30%
Meaningful	More meaningful solution	Student 1	I didn't understand why my product meant in the context of the organization.	0.20%
Meaningful	More meaningful solution	Student 17	But there is a premium that comes with an emotional and an empathetic, empathic, delivery of an experience or a product or a service. That, if a leader can understand it, then they can make the customers happier and, in that process, probably increase the willingness to pay--	0.50%
Meaningful	More meaningful solution	Student 3	based, you know, on those conversations with them, and looking at other business models,	0.20%
Meaningful	More meaningful solution	Student 16	I would say, "always" because if you don't use that, sometimes you're solving the answer to the wrong question.	0.40%
Meaningful	More meaningful solution	Student 6	I think they had identified it but not weighted it with the significance that it deserved.	0.20%
Meaningful	More meaningful solution	Student 4	there's always that one person who's had the foresight, or who's spoken to the end-user, who actually knows – he probably doesn't know he's using [emphatic]empathic methods, but. But every salesman, I would say, or every new guy who comes up with an idea has an inkling of why it would be successful or who would love it most.	1.10%
Meaningful	More meaningful solution	Student 17	So we have to make sure, from both the internal and the client perspective that this is what we want to find out	0.20%
Meaningful	More meaningful solution	Student 16	understand causation and correlation, what does it actually, what does this data mean? But if you have actual design-thinking and understanding the customer to back up that data, then it gives you a more clearer understanding.	0.60%
Meaningful	More meaningful solution	Student 17	I think, in empathy, in the innovation process, almost should bookend the process.	0.10%
Quality	Of better quality	Student 13	I think emotional response is a good thing either simply by just looking at employee engagement and how employee engagement and job satisfaction. That could be one way to look at it, but I think it will drive you to design a better product or service or whatever it is your company does.	0.80%
Quality	Of better quality	Student 12	We did do like trainings and workshops, and we did have specific methods that we would use to–to try and, you know, get better results, better stakeholder engagement. But it wasn't necessarily, like, oh, this is an empathic process that we're using. It was just kind of like how we'd get business done.	0.60%
Quality	Of better quality	Student 1	The, you know, the ethnographic research is going to get you to, kinda, that next solution, where nobody's looking,	0.30%
Quality	Of better quality	Student 5	Because I feel like data only goes so far. And the empathetic, empathy side, of things can inform yo	0.20%
Quality	Of better quality	Student 14	When you're coming in to actually innovate and coming up with new ideas, the empathic design methods, I think, are superior to quantitative.	0.40%
Quality	Of better quality	Student 14	I think a qualitative, empathic design process is very good at coming up with new ideas and understanding like, gaps and white spaces	0.40%
Quality	Of better quality	Student 13	would be better to start with ethnographic research because then I can shape my surveys. I can shape more rigid prompts to get information in a better way.	0.40%
Quality	Of better quality	Student 16	But it was really good to have it in class because having it said to your face is not something that you can just put on a paper and put to the side. So you really address it. And then you are also hearing what people are saying to other groups. And you think about, how can you apply that to mine and you're also giving feedback to other groups. So you're constantly thinking of how to make things better and really applying design- thinking.	1.50%
Quality	Of better quality	Student 7	the intimacy of ethnographic research unearths, or the objective of it should be, to unearth things that are uncapturable or unknowable or hard to capture or hard to know through quantitative data methods.	0.30%
Quality	Of better quality	Student 7	well executed or well done ethnographic research always yields more empathic understanding.	0.10%
Quality	Of better quality	Student 7	the CFO of a company would call me up and spend an hour on the phone with me. And whenever my boss would call them, it would be a 5-minute, very tense conversation and I think it was because the empathy	0.40%
Quality	Of better quality	Student 13	I just think you can be more certain that you're making the right decision if you're–if it's backed by both data and insights that are from empathic design.	0.50%

Category	Code	Case	Text	% Words
Quality	Of better quality	Student 15	Because then you can really differentiate your product or service.	0.10%
Quality	Of better quality	Student 6	at the end of the day, every single decision, whether it seems to be a financial decision, a strategic decision, or an analytics decision, at some point, it bubbles up to be about people and their needs and their wants. So I think, for me, that that's the, empathic design is just so related that it's, it would make sense.	0.80%
Quality	Of better quality	Student 17	I think in research, focus groups, in-depth interviews, and all this ethnographic stuff, it gets exciting when the person you talk to sees this as an opportunity to get their voice in improving a system	0.40%
Quality	Of better quality	Student 6	So I think when you combine those two together, it's like the left hook or the right hook.	0.30%
Quality	Of better quality	Student 3	Whereas if you didn't do that, then you'd be far less empathic with their situation thereand who they are.	0.20%
Quality	Of better quality	Student 7	So, you know, that's how I feel here. It means ethnographic research is on focusing on a one, or many ones, or maybe small groups, but it's intimate.	0.30%
Quality	Of better quality	Student 5	when you get face to face with someone, it's a lot different, and that's, you know, in the business world, face to face, I think a person is more open to you, more trusting of you.	0.50%
Quality	Of better quality	Student 2	would lead to a better product or service.	0.20%
Quality	Of better quality	Student 3	I can't really think of too many kind of business occupations where, you know, using an empathic approach wouldn't be super helpful, because, ultimately, I think you do want to understand the user's needs.	0.40%
Understanding	Improve the understanding of user	Student 12	it's like–overall, I would say that understanding the kind of how decisions were made I didn't kind of take that perspective before of, like, what was driving their decisions, and that gave me a better understanding of, like, how we could.	0.40%
Understanding	Improve the understanding of user	Student 16	I feel like first you need to understand the problem before looking at the data. So I think the customer interviews and the insights are important.	0.40%
Understanding	Improve the understanding of user	Student 12	and we came away with a much different result than we thought we were going to have.	0.20%
Understanding	Improve the understanding of user	Student 12	And, so, we–let's say you have a project in Rwanda or in Jordan, like, you're acting on behalf of those stakeholders in country, and so, really you need to have local partner. You need to understand the local context. You have to understand the government situation, and, so, if you did not have those characteristics in, let's say, your projects or proposals, you would fail. And so that was, incredibly important, was to have in country contacts, and also understand who the stakeholders and who the beneficiaries would be of your projects.	1.00%
Understanding	Improve the understanding of user	Student 12	Whereas data, like, could miss something that you wouldn't know unless you actually had the context to understand what was happening.	0.20%
Understanding	Improve the understanding of user	Student 1	And so they picked up that abnormal signal in the data, and then they figured out, through user research what was going on.	0.30%
Understanding	Improve the understanding of user	Student 23	I think understanding those things and really getting a sense of who the end-user was in that context made our department more successful in our job.	0.30%
Understanding	Improve the understanding of user	Student 1	The design office was trying to do persona development, to understand what the life is of a user in our vehicles throughout the day. The other would be our HMI team, so human machine interface team, which was tasked with essentially bringing in people and watching them use different things in the vehicle, to make sure that, you know, what we were doing did make sense in a user context	1.00%
Understanding	Improve the understanding of user	Student 16	rather than saying, would you rather do this or would you rather do this. Like giving them two options that kind of anchors them in, or just having pauses between your questions, giving them time to answer. It just changes the way that people respond to you.	0.80%
Understanding	Improve the understanding of user	Student 24	I realized I need to be really be in the field and spending a lot of time with cooks and students and so that was the first time that I sort of learned the importance of the customer viewpoint. But I don't think I would have articulated that until I learned these terms, you know, it was not something that I thought, "Oh, I'm going to apply empathic design to this process." It was "I should have been listening to people that are using this because they're the only ones that matter" and kind of realizing that on my own.	1.20%

Category	Code	Case	Text	% Words
Understanding	Improve the understanding of user	Student 17	as business school students, we all think that we understand people. We all think that we can be that forty year old lady, while we're twenty-something year old men, because we think we're smart.	0.40%
Understanding	Improve the understanding of user	Student 12	I guess like another data point, or another source of, like, why it could be a better business decision.	0.20%
Understanding	Improve the understanding of user	Student 16	hat was how having an empathic understanding ending helped us to guide what our new question would be.	0.30%
Understanding	Improve the understanding of user	Student 17	I think qualitative research allows you to dig deeper into the emotions and the feelings of why someone is choosing to do what they're doing	0.30%
Understanding	Improve the understanding of user	Student 1	it was super valuable to do the ethnographic research to find out each and everybody's kind of different personality quirks, and see maybe why they converged.	0.40%
Understanding	Improve the understanding of user	Student 16	We found out that MBA students don't actually care about how much they are spending in terms of eating out. And it's just like one of the by-products of being an MBA student. And they use that opportunity to have student interactions, build relationships. So yes, they want to cut money, but eating out is not one if the places.	1.10%
Understanding	Improve the understanding of user	Student 11	More robust decision making and sometimes you – basically trying to find out what people really value of your service, of your product if you follow from an empathy driven approach.	0.40%
Understanding	Improve the understanding of user	Student 1	empathic research and understanding what these users are doing day in and day out	0.20%
Understanding	Improve the understanding of user	Student 3	We did try to put ourselves, like, in the shoes of the customers there, really understand, like, the goals of Caterpillar for the project, and kind of observed what was going on there in order to make the implementation more successful.	0.50%
Understanding	Improve the understanding of user	Student 1	The design office was trying to do persona development, to understand what the life is of a user in our vehicles throughout the day.	0.30%
Understanding	Improve the understanding of user	Student 16	It needs to change based on what the problem actually is, and what the client wants from it.	0.30%
Understanding	Improve the understanding of user	Student 6	we used a lot of the ethnographic research to start building the survey, to really focus on what we should be focusing on.	0.30%
Understanding	Improve the understanding of user	Student 1	If you can know what the user needs are, through that type of research, then it's going to improve your decision-making.	0.30%
Understanding	Improve the understanding of user	Student 22	it's amazing how much a better holistic view you have of the person and be able to then delve into, oh, you might like this product	0.30%
Understanding	Improve the understanding of user	Student 21	the problems that I saw working in really heavy quantitative teams was that people failed to understand the end user's perspective.	0.30%
Understanding	Improve the understanding of user	Student 21	empathic approaches help you to understand why users are acting the way they are	0.20%
Understanding	Improve the understanding of user	Student 5	we'd basically just go into the factory, and we'd ask them to, you know, just conduct their job as if we weren't there. And just see how they interacted with the pieces of work that pertained to us, so, for us, it was an RF gun, a radio frequency gun that they scan different parts. It was the, using the current label printer they had, or, you know, it was just observing all these processes.	0.90%
Understanding	Improve the understanding of user	Student 3	It was all about getting out there and talking to the students, understanding, you know, how they went about their day, what they did at school, what was important to them.	0.30%
Understanding	Improve the understanding of user	Student 22	Whereas, ethnographic research, that's basically what you're looking for is trying to understand the, you know, understand the person on an individual level.	0.30%
Understanding	Improve the understanding of user	Student 15	So I think a lot of them understand at least at a basic level that understanding their consumers is important.	0.30%
Understanding	Improve the understanding of user	Student 13	We could very easily just come up with our own idea of the world based on our own experience, and try to come up with solutions that way. But we knew that in order for it to be effective, we need–we had to go to the YMCA, observe the users, observe their staff, go to their website, understand their values	0.90%
Understanding	Improve the understanding of user	Student 20	improve their understanding of user needs in their decision-making process, and I think part of that is having the opportunity to see the solutions that are – that result from taking that approach.	0.40%
Understanding	Improve the understanding of user	Student 13	Just being close to that user will give you a better understanding of what he needs.	0.20%
Understanding	Improve the understanding of user	Student 9 (part 2)	it helps you – gets you closer to understanding your end-user	0.50%

Category	Code	Case	Text	% Words
Understanding	Improve the understanding of use	Student 20	I think is useful to have those skills because part of it's like, understanding how to guide the conversation in such that you get substantial feedback	0.40%
Understanding	Improve the understanding of use	Student 3	if you go through that process and do that, I think that you'll definitely have a much stronger sense of what the user needs	0.30%
Understanding	Improve the understanding of use	Student 13	ethnographic research will take you on why the changes of behavior. Just gives you a better understanding of what you're trying to study.	0.40%
Understanding	Improve the understanding of use	Student 1	what incentive people have to use something. And you may not understand those incentives until you actually do that ethnographic research	0.30%
Understanding	Improve the understanding of use	Student 20	they could very much talk about their experiences in the field, understanding sort of the user in a way that's closer to us than secondary research,	0.40%
Understanding	Improve the understanding of use	Student 1	You need to understand what drives them, what motivates them, how they speak, how they communicate, to hopefully give them an environment where they're working well and tightly within the rest of the organization	0.50%
Understanding	Improve the understanding of use	Student 1	ethnographic research as new insights	0.10%
Understanding	Improve the understanding of use	Student 4	And being close to the person, or close to the endpoint, always will help you design or decide whatever you do better than what it would have been otherwise.	0.50%
Understanding	Improve the understanding of use	Student 9	You learn, like, okay, well, why aren't you, why aren't you using this gun? Why are you using a hand tool instead of this gun? The gun is safer. It's faster. You find out the gun is not optimal use. You find out that it's not ergonomic or, like, the gun's all, it works 40 percent of the time to tighten these bolts, so then people were like, I'd rather just. I think people will tend to, most human beings will tend to optimize their work, especially in a wage environment where you're just tightening nuts and bolts all day. You know, it can be mind numbing, but, I think, you're always going to try to, like, make your job easier, you know?	2.20%
Understanding	Improve the understanding of use	Student 3	the traditional MBA student would be more open to it if you did have some of those things that you just said.	0.20%
Understanding	Improve the understanding of use	Student 8	ethnographic research would be better with versus qualitative or quantitative, I think, is better at finding out what they want when they don't know what they want.	0.40%
Understanding	Improve the understanding of use	Student 17	You start by understanding what people want, what's, what they want to change from their current state of being.	0.20%
Understanding	Improve the understanding of use	Student 2	is you're just trying to wrap your arms around this thing. Whatever the problem is, you're trying to get the most honest view of the problem and the opportunity that you can,	0.80%
Understanding	Improve the understanding of use	Student 2	we had to sort of immerse ourselves in the lives of members to understand how they could – how we could better align what the Y has to offer with what these people need so problem framing, opportunity finding, and we certainly couldn't have done that unless we sort of focused on getting that qualitative ethnographic research piece.	1.30%
Understanding	Improve the understanding of use	Student 10	observing people made us understand better what we were trying to do	0.20%
Understanding	Improve the understanding of use	Student 14	as well as kind of refining to make sure you're exactly addressing the user needs.	0.30%
Understanding	Improve the understanding of use	Student 3	So just kind of warming people up to this before you kind of toss them in and start teaching them these things.	0.20%
User needs	Meeting user needs	Student 3	But it needed to help the students and maybeit needed to be something that they would actually use	0.20%
User needs	Meeting user needs	Student 23	we were developing something that was very specific to the client.	0.10%
User needs	Meeting user needs	Student 3	Because I think that first experience with it, if that's a positive one, then I think you're well on your way to building on that foundation.	0.30%
User needs	Meeting user needs	Student 2	employed empathic methods more effectively, where they think about usability, but not – I mean the word “usability” doesn't directly translate when you're talking about sort of like, a process, but you could maybe think about sort of like the tension that might develop or the tension that might not develop because you have a well-designed process	1.30%
User needs	Meeting user needs	Student 7	It always helps, it always informs a business decision, with respect to meeting a specific user's needs, which means that it usually impacts decision-making with respect to meeting an overall user groups' needs.	0.40%
User needs	Meeting user needs	Student 3	you had to come up with a new way to target the product on like a specific niche of the market and how you'reyou were going to reach them and think about the attributes that were important to them and think about the messaging that would reach them	0.60%

Category	Code	Case	Text	% Words
User needs	Meeting user needs	Student 11	I was dealing with our clients across the globe and trying to understand my clients' requirements, taking those requirements, and creating a product that will help them address the requirements.	0.40%
User needs	Meeting user needs	Student 2	it's hard to argue that if you understand the user of your product, that you would somehow produce an inferior product	0.50%
User needs	Meeting user needs	Student 1	You know, ideally, you'd create the service or product based off of what exactly that user needs,	0.30%
User needs	Meeting user needs	Student 18	playing a heavy consultative role with the customer to make sure that they got the value out of the software that they had purchased it for.	0.20%
User needs	Meeting user needs	Student 7	so a lot of that was about making the organizations that we purchased that much more efficient.	0.20%
User needs	Meeting user needs	Student 17	It goes back to figuring out how you can deliver what the company wants to deliver, stay operationally efficient, but ultimately serving the purpose and the demands of what the customer wants.	0.30%
User needs	Meeting user needs	Student 1	So is it a feature that people need?	0.10%
User needs	Meeting user needs	Student 18	figuring out who was your audience and what do they actually want to know and you know what should you communicate to get your point across	0.20%
User needs	Meeting user needs	Student 4	organizations do realize that making the customer or the end-user happy is – works on loyalty of that particular user.	0.30%
User needs	Meeting user needs	Student 18	“Hey, walk me through how you're using the tool today. You know what other kind of products or software systems or Excel spreadsheets, whatever it may be. What else do you use outside of our system to help you make this decision?” And then, you know, trying to observe their behavior and understand, okay, they're doing this process again and again and again. Is there a way to incorporate that into our system so that they can save time and everything's kind of in one place, they don't have to jump back and forth between the two.	0.80%
User needs	Meeting user needs	Student 14	our innovations were around processes for better delivering to customers.	0.20%
User needs	Meeting user needs	Student 4	when we spoke to people with families, the decision of whether to partner with someone or not was made much easier after knowing that the end-users would really like if that decision was made and would really benefit from that decision. The – that was supported by the numbers	0.80%
User needs	Meeting user needs	Student 2	understanding the world in which you're working, the problem in which you're trying to solve, “What's the context?” and so that really does require an understanding of the end user.	0.70%
Value	Value of empathic approach	Student 5	I think that having a team of three initially really allowed people to buy into every piece of the work, because you couldn't split it up and I think that it was clearly communicated from the teachers of the class to the students that it is the whole team taking each step along the process together, to understand it	0.70%
Value	Value of empathic approach	Student 14	If you want to come up with something that's not extremely derivative, they're superior.	0.30%
Value	Value of empathic approach	Student 5	I think that having this empathetic design program or classes rounds you out.	0.20%
Value	Value of empathic approach	Student 14	for both the projects, the solutions that we came up with would not have presented themselves if we had not gone through the ethnographic process.	0.40%
Value	Value of empathic approach	Student 2	So we think that this – kind of the like potential to touch and change the world is much greater when you're employing the empathic side of business	0.60%
Value	Value of empathic approach	Student 13	I'm just thinking about several different competitions that triple M students have won in a business school wide competition, and it is by following this design thinking process paired with maybe hard numbers.	0.50%
Value	Value of empathic approach	Student 14	as part of the whole brainstorming creative process, it allows you to come up with ideas that you would not have	0.30%
Value	Value of empathic approach	Student 19	there were probably points at which having some data would have–might have informed our solution, but yeah. The qualitative ethnographic research was–I mean it was, – I don't know, it was – yeah, invaluable in identifying.	0.40%
Value	Value of empathic approach	Student 18	learning some of those techniques to kind of help push the customer further beyond just the answers you expect to hear and how you get – how do you illicit responses that will challenge your way of thinking, that's where I think it's been very valuable.	0.40%

Category	Code	Case	Text	% Words
Value	Value of empathic approach	Student 18	So that was kind of my skepticism was you know how would ever prove something, you're going to get more information sure but you'll never know for sure, that sort of thing. But I think having gone through the process and seeing what insights come out of it that you can't get from those other techniques and other approaches has definitely shown me the value of it.	0.60%
Value	Value of empathic approach	Student 6	But throughout that whole process, we never really said, what does this look like from a client's perspective in five years. We never really did that.	0.40%
Value	Value of empathic approach	Student 19	I'm not really sure that there's any substitute for qualitative research and trying to understand the user	0.20%
Value	Value of empathic approach	Student 13	I was able to prepare a more compelling case, or a better deliverable when I knew who was going to be affected and what they needed to include.	0.40%
Value	Value of empathic approach	Student 18	I always wanted to confirm what they were saying and in some sense probably lead them down like the solution that I was looking for, the answer I was looking for, and we got more interesting facts when wouldn't respond, we wouldn't react, and we would just let them continue talking you know about themselves or about their experience.	0.50%
Value	Value of empathic approach	Student 2	the conclusion of our conversation was how most of it should be spent on the core, but of what's spent, of looking at trying to sort of drive innovation on the fringe, the best methods for doing so are the empathic methods.	1.00%
Value	Value of empathic approach	Student 7	you just need to be very conscious of this intimate ethnographic research is giving you so much vital insight, but it's giving you vital insight into what? Into the particular demographic that that person comes from	0.40%
Value	Value of empathic approach	Student 6	whether watching what people are doing, asking them questions about it, it helps to really just put yourself in their shoes, and really understand kind of what's going through their heads.	0.40%
Value	Value of empathic approach	Student 20	really understanding, in a more in-depth way, what the user's needs are, where they come from, mismatches and expectations, and like, actually what's happening,	0.40%
Value	Value of empathic approach	Student 7	Was it the way in which the survey was asking the question? Was it something that was sort of uncapturable from a methodology standpoint on the data standpoint. Or, was it really that we were onto something really interesting and unique that no one had really unearthed yet? So I think when you combine those two, it's really helpful.	0.60%
Value	Value of empathic approach	Student 13	basically, triggering an emotional reaction from the person trying to back this recommendation forward, I think it's–it is definitely more effective.	0.40%
Value	Value of empathic approach	Student 7	if it's intimate, it's just intimate in a particular demographic and so it is so, so good at uncovering nuances or non-obvious insights. So it's very, very useful.	0.30%
Value	Value of empathic approach	Student 14	if you're not paying attention, you tend to think everyone else has the same Pain Pointspain points and cares that you do, which is not the case, even for something as simple as parking your bike	0.60%
Value	Value of empathic approach	Student 20	It's additional data about the target audience that you're trying to cater to	0.20%
Value	Value of empathic approach	Student 7	had we not been, I think, employed that type of empathy around the considerations of this key player and stakeholder, then the deal probably wouldn't have gotten done or if it had been done, it would've been done at a much lower price.	0.50%
Value	Value of empathic approach	Student 7	So it's tough, because the more someone needs it, the more likely they are to completely dismiss it on the onset and not give it a chance	0.30%
Value	Value of empathic approach	Student 21	I don't think we would've come to any of the valuable insights that we came to without going there and becoming a user and speaking to other users, and speaking to the staff.	0.40%
Value	Value of empathic approach	Student 18	So that was an example of a feature that was created at the direct request and kind of understanding of how the customer was taking this system and incorporating it into their overall process, something that we hadn't necessarily – you know, that we had kind of anticipated but it was – you know, ultimately the development was driven by the need being immediate for one of our larger customers	0.60%

Category	Code	Case	Text	% Words
Value	Value of empathic approach	Student 18	you want to rely on data and for me it's instinctual to want to look at the data and see what does the data say but that's not always going to work as cleanly as you want so that's when a lot of what I've been trying to focus on here is you know when does data work, when doesn't it work, how do you marry those two sides together so that you can you know make the right decision but you know not rely too heavily on data but also not discard what may be you know useful insights.	0.90%
Value	Value of empathic approach	Student 13 (part 2)	I think our solution would have been a lot better had we talked to the maestro, had we talked to musicians, had we talked to staff and their customers, to really understand what brings them back to Sinfonietta, why they want to play there, why they want to play a certain type of music, why they want to engage the community.	10.10%
Value	Value of empathic approach	Student 5	It's fine to see a written mission statement, and a set of values, but you know, as we all know, sometimes what's written is not what is actually practiced. But then once you talk to them, you may learn something else about them that is not as easily observable. Like, someone could have a happy face on, but, internally they could be really upset about something that they would tell you about	0.50%
Value	Value of empathic approach	Student 21	as long as there's a human user at the end, which there virtually always is, then I think understanding the perspective of that user is important	0.30%
Value	Value of empathic approach	Student 20	by virtue of incorporating discussions with the client and understanding their concerns, experiences, etc., it's definitely valuable	0.20%
Value	Value of empathic approach	Student 7	the only way to get the true information is by being empathic.	0.10%
Value	Value of empathic approach	Student 5	like your blood pressure can only say so much, but if you know a person's, where their mind is, you know, you can almost understand more of the influences, rather than just taking the symptoms of something	0.50%
Value	Value of empathic approach	Student 17	your assumptions are either confirmed or proven wrong. And the proven wrong is sometimes the more interesting part.	0.20%
Value	Value of empathic approach	Student 18	the data might show a symptom but you won't necessarily know the cause unless you go to the customer or to the user to ask them about any more detail.	0.30%
Value	Value of empathic approach	Student 16	I mean the methodology never told me what the solution was going to be. So we would have had to re-engineer the solution.	0.40%
Value	Value of empathic approach	Student 17	without, like, bias.	0.00%
Value	Value of empathic approach	Student 6	I think every single business school needs to have it, because every single business school, at the end of the day, is about people.	0.30%
Value	Value of empathic approach	Student 16	I would say, "always" because if you don't use that, sometimes you're solving the answer to the wrong question.	0.40%
Value	Value of empathic approach	Student 16	If you don't understand what user needs are, you can't make good business decisions because your business is based on your customers and your end-users.	0.50%
Value	Value of empathic approach	Student 22	And then you kind of see how things evolve throughout the process of delivering your results or finding your results, and you realize that the structure, and just following that process, actually lead you to something that you likely, or definitely wouldn't have come to without the process.	0.60%
Value	Value of empathic approach	Student 16	making decisions when you base them off of understanding your customers, gets you to the right solution.	0.30%
Value	Value of empathic approach	Student 17	I, as a, like, a twenty-something year old man cannot possibly imagine what a forty-something year old woman would be thinking. And in that sense, like, even if I could anticipate what that lady would say, she could very well bring up something that I would've never thought about.	0.50%
Value	Value of empathic approach	Student 12	talking to people, understanding kind of what is–what is driving the decision making might give more context to what your data is showing you.	0.30%
Value	Value of empathic approach	Student 12	when you're making a decision–it comes from, I mean, it could come from just your own perspective. But, like, for the most part, you're probably thinking about your customer. Like, you're almost always thinking about what does my customer want? Because I want them to buy this widget or whatever it may be. Or I want them to, like, download this app or whatever.	0.70%
Value	Value of empathic approach	Student 2	Developing choices, finding unmet needs	0.10%

Category	Code	Case	Text	% Words
Value	Value of empathic approach	Student 7	And so it's valuable to me, because I want to understand where they're coming from and what they're thinking and how they might-- what they might appreciate me doing differently and, therefore, be willing to pay for me to do differently.	0.50%
Value	Value of empathic approach	Student 12	But like, profit is dependent upon your customer, your user, your client, whoever, because they're the ones that are attracted to your company or your service or whatever it may be. So it may not be formalized in terms of actually saying it that way	0.50%
Value	Value of empathic approach	Student 5	because of what we were taught in this class, like, it allowed us to see influences that wouldn't have normally been seen.	0.30%
Value	Value of empathic approach	Student 23	help us develop some extremely valuable insights that really brought our idea to life and I think the richness of those conversations really was a tremendously important aspect	0.30%
Value	Value of empathic approach	Student 2	trying to solve a problem only using quantitative research, the solution was much better with qualitative ethnographic research employed.	0.40%
Value	Value of empathic approach	Student 14	so the two projects that we did, one was with bike racks and I think the ethnographic research there was actually extremely informative and helpful. Like, I got a lot of insights that I would not have --– even myself as a bike user, I would not have even thought about.	0.80%
Value	Value of empathic approach	Student 6	I think being able to look at the numbers and saying, okay, the numbers look great, but then being able to step back and say, what does this mean, from a user perspective, is really powerful.	0.50%
Value	Value of empathic approach	Student 23	Ethnographic research probably gets a lot more the latent things which I think are a bigger part of user decision-making, and so I think that that is where the value of ethnographic research really presents itself.	0.40%
Value	Value of empathic approach	Student 23	it draws you a little closer to the problem as a problem solver so I think you develop a more intimate understanding with what the issue is which makes you a better storyteller about what the issue is, a better storyteller or about what the solution is going to look like.	0.50%
Value	Value of empathic approach	Student 23	So I think to the extent that the empathic design allows you to draw yourself closer to the problem, I think that always makes the innovation process a much richer experience.	0.30%
Value	Value of empathic approach	Student 23	Understanding who the stakeholders are and understanding what they value allows you to deliver a solution that's more in lined with what their expectations and desires are.	0.30%
Value	Value of empathic approach	Student 23	we might not be able to see a lot of things in data that might be really valuable and I think that empathic design probably gives us an opportunity to tease out some of those tendencies	0.40%
Value	Value of empathic approach	Student 7	the intimacy of ethnographic research unearths, or the objective of it should be, to unearth things that are uncapturable or unknowable or hard to capture or hard to know through quantitative data methods	0.30%
Value	Value of empathic approach	Student 5	That really was able to uncover that our project wasn't so much about knowledge management, that it was about passion management.	0.30%
Value	Value of empathic approach	Student 11	it is very essential to understand what are the things that the people you are working like or they do not like and you – following the empathic design approach helps in trying to understand that.	0.50%
Value	Value of empathic approach	Student 7	go back and identify some other, look at the those other needs you identified, which maybe weren't as salient, but by the way, impact 40%	0.30%
Value	Value of empathic approach	Student 7	You know, to read about someone who's experiencing a very personal issue is much different than being in the room with them when they experience that deeply personal issue.	0.30%
Value	Value of empathic approach	Student 11	I feel – especially when I'm driving innovation within my team – finding an empathy driven design would help me – at least give me the confidence that the approach that I'm following or the changes I'm making would be robust compared to just using data to make my decision.	0.70%
Value	Value of empathic approach	Student 11	you're investigating for certain clues, and empathic driven design – empathy driven design would help you unearth those clues, and then you can make whatever you want to make out of them	0.50%
Value	Value of empathic approach	Student 7	a non-profit community is fantastic, because they love the help, you know. They'll take what they can get and so, and also, they are serving people in need. So you enter in that kind of scenario, and, suddenly, the stakes are very raised for you in a personal standpoint. Here are people who really need your help, really value it, and, by the way, it's kind of difficult to not be empathic towards what they're doing	0.80%

Category	Code	Case	Text	% Words
Value	Value of empathic approach	Student 12	the story from your customer of why they want it makes it a much more kind of richer story about, like, why this will create revenue for your business.	0.30%
Value	Value of empathic approach	Student 12	finance in isolation without really understanding the impacts of your decisions are, like–it's kind of useless	0.20%
Value	Value of empathic approach	Student 22	because sometimes the results seem like a common sense thing, that, you know, you're like, oh, I would've seen that if I had been there. I wouldn't have needed to go ask somebody if they, why they weren't using the machines, but once you get in that context and you realize that you have no idea where to start, and then you just dig in and really talk to people and then you kind of start to understand these situations. And then you learn the patterns and put them in the frameworks, I, it just, it worked every time that we did it. And I think that you have to be in that situation in order to appreciate it.	1.40%
Value	Value of empathic approach	Student 22	that led us down a whole different path than we had even ever thought about.	0.20%
Value	Value of empathic approach	Student 11	It doesn't take a lot of time in some aspects and going through the exercise as we discussed earlier helps you understand what are the real problems that the end user is facing.	0.50%
Value	Value of empathic approach	Student 11	teams that won that competition, all of them used ethnographic research in some form or the other, and there were other participants who were not very familiar with ethnographic research. They didn't win at all.	0.50%
Value	Value of empathic approach	Student 5	to really be able to get an accurate portrayal of their task at hand.	0.20%
Value	Value of empathic approach	Student 11	I think we could have ended up with the same insight, but I think it would have taken us a little bit more time, and we had – we would have spent a lot of energy dealing with other things, which were not essential in this case.	0.70%
Value	Value of empathic approach	Student 13 (part 2)	we felt that we really couldn't pull that much information from the data that was given. There's only certain, you know, certain things you can do with a financial statement.	3.50%
Value	Value of empathic approach	Student 11	Then we also talked to people who were not members of the Y, and then we tried to find out, “Why are they not members of the Y? Why are they not using the facility of the Y?” That gave us a nice insight, trying to understand that people – some people really do not know about the Y. Some people had – like members the Y has, like residents the Y has and people who are not very comfortable coming to the fitness center because of those reasons. So there were certain different reasons, which I think would have been difficult to find based on the consulting approach.	1.50%
Value	Value of empathic approach	Student 3	They were insights, like, grounded in what was actually going on at the YMCA, and they were kind of found itfounded on things other than our own personal kind of viewpoint, or outour own personal biases.	0.40%
Value	Value of empathic approach	Student 3	by doing the qualitative research, that includes having interviews with the users or just kind of watching the users in their natural workplace and. And so doing both of those things, definitely leads to being able to more easily put yourself in their shoes.	0.50%
Value	Value of empathic approach	Student 11	when we started talking to people, we realized that some of the ideas that we had were not actually problems for people or even if they were, they were not that serious of a problem compared to other things.	0.60%
Value	Value of empathic approach	Student 3	"Based on our conversations with these specific people that work at the Y, this is what we think will be effective for them"." It wasn't just like, "Here's what we think will work based on what we think" you know?	0.50%
Value	Value of empathic approach	Student 3	We took the solution, kind of, out our own minds and founded it on the actual people that were there, so that kind of, I think, helps give it more credibility, especially with the people who you're trying to get to adopt it	0.50%
Value	Value of empathic approach	Student 13	Because ethnographic research lets you get closer to the person you're analyzing.	0.20%
Value	Value of empathic approach	Student 3	be able to meet those needs more effectively than if you hadn't used the empathic design.	0.20%
Value	Value of empathic approach	Student 13	focusing on what you think you know and just on the quantitative side just doesn't–is not enough.	0.30%
Value	Value of empathic approach	Student 2	So this program is a program that we believe has foresight	0.20%

Category	Code	Case	Text	% Words
Value	Value of empathic approach	Student 7	The lack of rigorous data is its own biggest obstacle, but, also, what makes it so rich, so it's overcoming this, which is the biggest piece. You almost have to drive people through this period of skepticism and get them through the other side to where they're seeing the benefit of it, and, that I think that's the biggest issue.	0.70%
Value	Value of empathic approach	Student 13	plus an understanding of how people feel about what they're doing	0.20%
Value	Value of empathic approach	Student 10	You wouldn't keep people interests if it was not project-based and practical type of learning firm	0.30%
Value	Value of empathic approach	Student 8	you're making a decision the more lenses you look at it, the more the better so empathic doesn't necessarily have to be the only one, but I think that it should be included.	0.50%
Value	Value of empathic approach	Student 3	I think it just gives you a more holistic approach in understanding, kind of, of the problem which would definitely lead to a more meaningful innovation.	0.30%
Value	Value of empathic approach	Student 10	I think that even though those business leaders, even though they didn't participate on the process of conducting all the research and getting to the insights and getting to final results, I think if they understand the process even though they don't participate will make them – that would inform you and help them take better and more informed decisions.	1.00%
Value	Value of empathic approach	Student 2	I would say that they're – we do share a common lens in some disciplines over at the business school, but for the most part, I would say it's a different toolkit.	0.70%
Value	Value of empathic approach	Student 10	They give you a survey with already like choosing words and choosing answers and you ask those people to choose between those options, you can be missing a lot of information, you can be leading your survey to whatever you want to go so	0.70%
Value	Value of empathic approach	Student 10	I think that if you make a decision having that understanding of how people think, how they behave and how much we thought about the problem, that will definitely lead to – like we will always make a better decision using those tools.	0.70%
Value	Value of empathic approach	Student 14	I attribute that entirely to actually sitting down and observing them and understanding their needs.	0.20%
Value	Value of empathic approach	Student 14	ethnographic research is extremely helpful in understanding the customer. Especially, especially if it's a market or an area that you're not familiar with yet already.	0.40%
Value	Value of empathic approach	Student 8	empathic approach is a valuable way of finding out they want when they want when they don't know how to tell you.	0.30%
Value	Value of empathic approach	Student 10	I've learned so much by taking my time going and talk with these people, making observations, talking to people, also getting the data and mixing the data with my observations	0.50%
Value	Value of empathic approach	Student 3	the type of work that I want to go into is, you know, tech product management and it very much involves being able to understand, like, user needs and develop a tech product to meet those needs. So, for me, I think, certainly, it's valuable and.	0.50%
Value	Value of empathic approach	Student 1	So you might not get the business requirements you need put into the product	0.20%
Value	Value of empathic approach	Student 7	And just because they don't agree, doesn't mean that you throw out the ethnographic research, right? It could actually just point to something really interesting that you should dig deeper on.	0.30%
Value	Value of empathic approach	Student 3	I think they would think it was pretty interesting, and I think they would see how it's, you know, relatable and effective.	0.30%
Value	Value of empathic approach	Student 8	business leaders using empathic design is that it's always better to have more lenses than fewer, and I think it's a very different lens than a lot of other things we learn.	0.50%
Value	Value of empathic approach	Student 14	just by doing the qualitative ethnographic research, you're listening to people, and that's immediately going to give you a much better ability to put yourself in their shoes.	0.50%
Value	Value of empathic approach	Student 14	if you want to make something that your customer wants, you have to be able to put yourself in their shoes. Unless it's a very uncompetitive market, if you own the only store on the island, then you don't really have to care what your customers want. But, but in the modern business world, you need empathy.	1.00%
Value	Value of empathic approach	Student 5	I think that these methods can be applied across industries. So I think that it's very helpful. It shouldn't just be in design school.	0.30%
Value	Value of empathic approach	Student 3	But if you have a crappy experience at the get go, thinkingI think you might be jaded and might not give it aanother shot again.	0.30%
Value	Value of empathic approach	Student 1	what it kind of exposes you to is a different way to think	0.20%

Category	Code	Case	Text	% Words
Value	Value of empathic approach	Student 5	it may not have been as accurate, but we were able to collect a number of key insights about the individual doing their job.	0.30%
Value	Value of empathic approach	Student 1	we don't focus on, you know, the theory of it to understand how it might manifest itself in day to day living.	0.30%
Value	Value of empathic approach	Student 1	you also need this exposure to empathic design, because it's another tool in your tool belt to help frame these problems properly.	0.30%
Value	Value of empathic approach	Student 14	–I think empathy is the key. And and you can have empathy without speaking "the language of design".	0.30%
Value	Value of empathic approach	Student 1	until you actually interview users and do that empathic research. And then, once you do that empathic research, and you find this new approach that you're looking for, then you might drill down and do the optimization with, you know, the new metrics that you're able to measure.	0.70%
Value	Value of empathic approach	Student 3	So you should start with these very qualitative methods of just talking to people and going in without any biases and just trying to set, like, a ground level foundation of the world that you're working in.	0.40%
Value	Value of empathic approach	Student 15	I can't necessarily understand why that person is likely to do that, and that's where I think more of the observation, interviews, understanding the psychology of how people are behaving is a really critical piece. Because like it's good to be able to like predict who's most likely to do something next, but it's a whole other level to understand why.	1.00%
Value	Value of empathic approach	Student 4	I realized you could sell emotion and have that succeed as well. So, I would sell experiences. When I submitted one of my two ideas, I would stress on how the person or customer would feel. So – but I was not trained in it; that. That was just a gut feelfeeling saying, “This might impress people if I brought this in or if I spoke to three people about what they expect.”	1.20%
Value	Value of empathic approach	Student 1	valuable to get that first hand experience of what dealers are doing every day and how they think, to understand how we can capture, kind of a piece of their mind share in their work flow, to extract the data we need to craft a successful solution	0.70%
Value	Value of empathic approach	Student 18	had never considered that as a problem, so that was something that – I can't think of any data that would've told us that. You know there's certainly no data collected by Spak that would've told us if that was a big pain point for the users. It just came out of asking questions and in letting them talk about their experience at Spak.	0.50%
Value	Value of empathic approach	Student 4	I would have used it more had I known that this could bring results.	0.20%
Value	Value of empathic approach	Student 4	once you know yourself, once you know how you react, you can start thinking how the other person might react	0.30%
Value	Value of empathic approach	Student 4	Ethnographic research, talking to their customers, talking to other families who were their target market brought up a very interesting spin on the solution saying, “What would make them happy if their wireless provider did this for us?” andAnd we presented that to the client, and we ended up getting first place.	0.90%
Value	Value of empathic approach	Student 15	other than like using empathetic design, I don't think there's a good way to really understand consumers. Like really understand them.	0.30%
Value	Value of empathic approach	Student 15	Everyone is shaped by like millions of past experiences and outside influences and stuff that's impossible to ever really capture and what limited data companies have on people. So I can't think of–I can't think of a way that you could really get to those motives without doing empathetic design.	0.80%
Value	Value of empathic approach	Student 4	wouldn't have happened if we hadn't used some sort of empathy approach –, those were always more successful than the rest.	0.40%
Value	Value of empathic approach	Student 1	involved in your day to day being able to mediate different conflicts, or being able to mediate a group and understand what the different individual's needs are behind kind of what they're saying	0.50%
Value	Value of empathic approach	Student 9 (part 2)	when it comes to innovation, the process and outcomes, I think it would – it's obviously – it's always going to be of better quality in that respect.	1.20%
Value	Value of empathic approach	Student 15	Like I know people are different intrinsically, but I don't think I would've understood the extent to which people are different and the extent to which that means you need to change the design of products and services	0.60%

Category	Code	Case	Text	% Words
Value	Value of empathic approach	Student 9 (part 2)	think qualitative and empathic design can help when you're kind of like, at a crossroads. It can be the thing that moves the needle,	1.10%
Value	Value of empathic approach	Student 17	I think having some aspect of empathic design mentioned in courses could be useful to everyone.	0.20%
Value	Value of empathic approach	Student 1	I don't think that insight could have been yielded from any other type of research.	0.20%
Value	Value of empathic approach	Student 4	project that might not be able to translate to what it does in the end. You're selling a huge chunk of machinery that ends up in a factory that you can't really relate to, but innovation's involved, but you can't relate put an [emphatic]empathic spin on it.	0.90%
Value	Value of empathic approach	Student 6	expand the ways I innovate, expanded the caliber of ideas that I think are good.	0.20%
Value	Value of empathic approach	Student 4	The biggest difference that I found when looking at the presentations: all the [emphatic]empathic design trained MBAs, they focused on the user, which is what sold the presentation to the customer.	0.50%
Value	Value of empathic approach	Student 16	I wouldn't, we wouldn't have discovered that if we didn't use the methodologies we learned in RDB	0.30%
Value	Value of empathic approach	Student 1	doing new research in a unfamiliar market, I find that to be very, very valuable.	0.20%
Value	Value of empathic approach	Student 4	reading about someone's experience is not the same as experiencing it with them or looking at them experiencing it.	0.30%
Value	Value of empathic approach	Student 17	I think if a company doesn't use empathic design and they just come up with strategies that are business-driven, you're going to lose your customers and you're not going to be a company that people have an emotional connection to.	0.50%
Value	Value of empathic approach	Student 6	for every area in business, I think there's a place for it, but it's not necessarily going to be the main part of each of those areas.	0.40%
Value	Value of empathic approach	Student 4	I don't think one can be successful without the other,	0.20%
Value	Value of empathic approach	Student 4	And, I also know in this world, if you want something to be successful, it has to really gel well with who you're trying to affect. So an empathy-based solution almost always gets you closer to doing so.	0.70%
Value	Value of empathic approach	Student 17	each of them can bring up nuances that we wouldn't be able to brainstorm, and they bring up perspectives.	0.20%
Value	Value of empathic approach	Student 17	I think it's absolutely critical to understand your customers, and the peop-, and all the stakeholders that are involved in the process.	0.20%
Value	Value of empathic approach	Student 6	before you can do a fancy questionnaire, you need to know what to ask.	0.20%
Value	Value of empathic approach	Student 6	And it's really hard to use data to get there.	0.10%
Value	Value of empathic approach	Student 4	knowing that the users actually will benefit and make use of the new solution made it that much more better, and I can just see myself using this over and over again.	0.50%

Appendix N

Academic Member Interview Email Invite

Dear XYZ,

I'm working on my PhD through Coventry University in the UK and would like to conduct a structured one on one interview with you over the next 2-3 months as part of my research.

<u>The topic area is design thinking in business education.</u>

There are no right or wrong answers and I highly value your perspective……again, this is not NU related. You will be anonymous.

Could you let me know of your willingness via email, and I'll work with you to schedule a convenient time as per your calendar. The interview will take between 1 to 2 hours.

If you are not interested in participating, I completely understand.

Simply email me if you are willing to participate.

The IRB study number is: STU201508

Thank you,

Greg Holderfield

Appendix O

Interview 2: Academic Member Interview

Title of Research Study: Do business students value design thinking and if so, how might they learn it?

Principal Investigator: Greg Holderfield, PhD Candidate

Supported By: Coventry University, UK, School of Design

IRB study number: STU201508

Participation:

I'm asking for your participation in this research study because you are a professor who teaches innovation centric content that includes design thinking to business students, within the school of business, at your respective university.

I seek to understand, in your opinion and based on your academic experience within business school education, your responses to the following questions.

Participation Implications:

- This interview is completely voluntary.
- You will be anonymous.
- There is no right or wrong answer.

Participation Logistics:

- The interview questions will be emailed to you prior to the interview.
- Data collection will be conducted by way of a pre-arranged phone call, in which I will document your responses.
- The interview will be audio recorded to ensure that I have captured your responses correctly.

- The recordings will be transcribed and used as part of the academic research.

Interview Questionnaire:

1. Within your business school institution, is design thinking taught as part of the core MBA curriculum?

2. Is design thinking an important part of a 21st century business school education?

3. Does the introduction of design thinking to the curriculum of business students improve their understanding of user needs in their decision making?

4. Does increasing the understanding and use of design thinking have an impact on business decision making with respect to meeting user needs in a meaningful way?

5. How have your business students learned design thinking best?

6. What difficulties have your business students had in learning design thinking?

7. What have you found to be the ideal environment for business students to learn design thinking?

8. What elements of the design thinking process have you found to be valuable for business students to learn?

9. What is the value of design thinking to business students?

Appendix P

Academic Member Interview Example

Q: So again, thank you so much for doing this. Let's jump into question one. Within your business school institution, is design thinking taught as part of the core MBA curriculum?

A: Yeah. It has been – we have included it as a one unit – well, it's complicated. We – for the fulltime MBA students, it's a required one-unit class that sets them up to apply design approaches in their three-unit Applied Innovation courses and they are required to take one of those, at least one of those, while they're in the two-year program. And we've been doing that for, I think, seven years now that that's been required. So we call it Problem Finding, Problem Solving which is our version of a mash-up, really, of design thinking, lean start-up, a little critical thinking.

So for the fulltimes, it's a one-unit class. For the evening/weekend students, we've gone through a number of iterations but it's now a really sort of a three-unit class that combines a little bit of Problem Finding, Problem Solving, a little bit of a project and then a like a weekend retreat where they apply the approaches to various kinds of problems. And then for the executive MBA program, we deliver it to them in the form of a required 1-week immersion experience. So we have sort of maybe half classroom time and then half time spent visiting innovation centers in local firms as well as design firms so they get a sense of the industry as well as the approach. And then I have about a third of them who take a follow-on Advanced Innovation course where they work on their own projects based on the stuff that they learned in the immersion week. So the answer is yes and that has been part of all three of our primary MBA programs now for like seven years.

Q: Okay. And then, as part of the core, so how many MBA students, fulltime MBA students, are you running through this class, Problem Finding, Problem Solving?

A: Yeah. So there's 250 fulltime MBA students a year, there are about 250 evening/weekend MBA students a year and there are about 70 executive MBA students a year.

Q: Okay. And then, when you describe a unit, how many weeks is that?

A: A unit is fifteen hours of in-class time and thirty hours of outside-class time. The fulltime class we've – well, it's complicated. This might be a response to some of your other questions but the fulltime class has historically been run as a half semester course, so seven weeks. What we're experimenting with now is putting some pieces of that online so that the rest of it can run in parallel with their Applied Innovation classes so they have a more immediate application of their work. So that's now running, let's call it as year-long course off and on throughout the year. The evening weekend course was ran in – sometimes, we used to do the one-unit version as a one week, fifteen-hour in-class, so three hours a day for five days. Now, it's run as a full semester course, the two-unit one so that's thirty hours of in-class time and sixty hours of outside class time and then the immersion week is basically five days but that's a two-unit course. Yeah.

Q: When you described – if you could give me a little bit more detail on, you talked about fifteen hours of in-class, so what does that look like?

A: So most of the in-class work we try to do is pretty hands-on. So this is part of what we're trying to parse out for the hybrid version of it. So if there's background or a theory that is useful to them to understand what this is all about, we try to leave that to the reading material that we assign so that the in-class time can be spent let's say, seventy-five percent of it in application. So there's kind of two approaches to the application: one is in the one-unit class where they don't really have enough time to work on a meaningful project. The application would come in the form of a series of short exercises where, for example, they would do interviews with one another in the classroom or they would do a diverge-converge exercise around a 'How might we" question or whatever.

When we have more units to work with, then – and it's spread out over a longer period of time then we might have them work on a project that has some continuity which allows them to get a little bit more in-depth in using some of the tools and techniques. So that's – but they would still – in that case, it still, for the evening/weekend students because they have fulltime jobs, it's really hard for them to spend time together to do teamwork so we try to spend the three-hour, you know, class sessions having them have a lot of time in their teams and guide them through application of the tools and techniques in their teams, which implies a fair amount of coaching availability typically if you have sixty students or twelve teams in a classroom at any given time.

Q: I see. So then with the thirty hours outside of class, is that being applied to a project-based learning approach or they --

A: Yeah.

Q: Are they doing something --

A: I mean, it depends really on the class. So in the case of the evening weekend students for example, I would have them do a lot of individual work outside class that prepares them for the teamwork that they're doing inside class.

Q: I see.

A: It's also true for the one unit. So for example, I might be teaching them, you know, interviewing and observation, so their homework assignment would be to go out and conduct an interview or observe people, for example, on fruit consumption. And then when they come to class, they will debrief that interview data with a team.

Q: I see. Okay. Okay.

A: And they would come up with insights. So I'm teaching them sort of, well – I mean, this is a lot of the stuff that I think a lot about. The question is, how do you teach individual skill development, for example, interviewing and the use of design techniques, in teams? And I feel like finding the right balance between those two is really complicated because well, just in terms of time if nothing else, I mean, I thought about just teaching an entire course of this around individual skill development, like how do you observe and notice? How do you frame and reframe? How do you step back from a problem, frame and reframe it? How can you generate alternative ideas? Imagine and design yourself like generate ideas? And then how do you make an experiment? Can you build a prototype of something? Can you try something out on someone else? All those four are really individual skills that then have to be practiced in teams.

So some of what I try to do is figure out how do you strike a balance between having individual students, particularly around interviewing because they're kind of not very good at it. So how do you – how did you help them go out and practice interviewing and give them feedback on their individual interviewing skill. At the same time, you know, you're trying to have them learn what it's like to collectively debrief a set of interviews and learn something from it.

Q: I see.

A: So – there's that balance, there's also the balance just of -- you know, for a lot of our students, having to work in teams outside class is just really difficult, you know, particularly in multi-disciplinary classes where the students, you know, from the Design Department may be on a completely different schedule than MBA the students. So that's why I try to kind of maximize a lot of teaming time in class. It's also a chance to coach them on what they're doing. So anyway, I don't know if that's helpful.

Q: Yeah. No, that's terrific. That's really helpful. And we'll dive into – we can get to some more of those details as we break through these questions. We'll jump to number two which I probably should have shifted to number one but I'll read the question and then let's just talk about this a little bit. So question two, is design thinking – again, in your opinion, is design thinking an important part of the 21st Century business school education? So can you give me a perspective on that?

A: Yeah. I mean in short, I think the answer is yes. I think it depends a little bit on what you include in design thinking. I think critical thinking is also important and – so here's what I think a lot about this sort of maybe it's just thinking and how do we actually equip students to basically go through those four capabilities in the learning cycle. How do we get them to pay explicit attention to how they observe and notice? And, you know, the first chapter in Critical Thinking books is about paying attention to the world around you and what you see and what you don't see. So I think that's really important.

I know in design thinking we kind of translate that into customer empathy but if you look at the organizational literature, equally important to have empathy for employees or others. So there's emotional empathy, there's cognitive empathy, if you look at Goleman's work. So there's observe and notice which is critical

whether you want to say that's only a design thinking thing, right, like it could be that I'm looking a lot of big data in observe and notice and I'm trying to find patterns in that data. That's also important, that I'm asking good questions. So the frame and reframe, like how do I take all that messy data, that again is, you know, there's critical thinking tools there as well. What's a stock? What's an inference? What's assumption?

You know, we talk in design thinking about assumptions but they're also important parts of other – and to me, that quadrant of framing and reframing is at the heart of what we need to be teaching students to be able to do; is to really say what is the problem that I'm trying to solve here or what is the opportunity I'm trying to leverage here? How do I go about understanding it and how do I go about defining it? And again, design thinking has a lot of great tools that can be used for that but I don't think we should throw out quality management tools either, right? So is a mindset valuable in framing and reframing? It probably is. If I'm asking the five whys, is that from design thinking or is that from quality?

So I think a lot of design thinking – and in fact, if you look at what IDEO and others do, they skip right over that quadrant and I think they do it because it's hard and it's much more fun to kind of say, "I want to go talk to some customers and then we'll just brainstorm some solutions." And in fact, if you don't actually get interesting insights out of talking to customers, you're not going to brainstorm very interesting solutions but teaching people to get to insights, to get to why, to frame and reframe a question is super, super important and hard.

Q: So this --

A: Imagine and Design – and that's on the why side. That's probably the most critical stuff that I think 21st Century students need. The skills we teach on the 'how' side, they still need them. Diverge, converge come up with multiple different solutions. Don't just converge on the first one, that's important and, you know, I think that's a standardized testing problem that we just trained a lot of students to come to the one and only answer. So that's important, and then making and experimenting – this is probably the other thing that's hard for students; is to be willing to try something out before it's finished.

Q: The notion of prototyping?

A: Right. But, you know, I talked to students about prototype the presentation you're about to give to your boss, right?

Q: Right.

A: I mean, I can prototype a lot of things. And the mindset of our students, of a lot of people I mean, a lot of people is 'I have to finish it before I show it to you'. So whatever you want to call a prototype, right but can I just run an idea by you? Can I run a presentation by you? Can I – those are just sending a flag up the flagpole to see what happens.

Q: Yeah. This notion of polish, do you find that to be more prevalent with your business students as opposed to your engineering students or do you think that's sort of an equal realization that they want to perfect it before they go public whether it's casual or not?

A: Yeah, I don't know. You know, I teach a class called Collaborative Innovation that has art practice, theatre and business co-teaching it. We have students not just from engineering and business. I think that art and theatre, in general, are better at it because it's built in to how their discipline works. I mean, I rehearse a play many, many times, right, so there's some inherent rehearsal nature of what they do. I think artists have a similar mindset. I'm not sure I would say that engineering students – you see, the problem is that all the kids who come to UC Berkeley did really well on standardized tests. Fifty percent of them test out in the upper right hand quadrant as converging learners, so that's – at least for engineering and business students, that's particularly true. It's a little less true for the other students although it's still a bias to abstract thinking and to converging pretty quickly. Some engineers are tinkers. I don't know if I – I'm struggling with the answer to your question to make a gross generalization.

Q: Yeah. No, I'm not asking you to do that but --

A: No, I think some of them are tinkers and therefore, they sit there and you watch them in class like just building stuff and playing. Some of them, I think, have more of a – yeah. How, I guess, I would think about is that they're very "in their heads" people. So they like to work it to completion in their heads instead of working it to completion through testing it, through trying it. Does that make sense?

Q: Yeah. No, that makes sense quite a bit. Question three, we've actually talked about this quite a bit in too. I'll read the question then we can focus maybe on the backend of decision making. The question is, does the introduction of design thinking to the curriculum of business students improve their understanding of user needs in their decision making? And if you could, you know, build on that question or perhaps cite some examples you've seen in your classroom, etcetera.

A: Well, this is another tough question. I'm not a very good sound bite person.

Q: No, you're --

A: I make everything too complex.

Q: No, you're doing fine. This is perfect.

A: Here's the challenge with this question. Let met step out of it for a second.

Q: Yeah, sure.

A: I do a lot of Exec Ed and working with companies. The question is whether I even associate customers with decision making in a company and MBA students come from environments where that isn't how decisions are made. So the challenge is, we can take them through the processing class of go interview some customers, extract some insights from those interviews, come up with the 'How might we' question and then come up with ideas that answer that 'How might we' question under the theory that they're tracking customers all the way through the process and therefore taking them into account when they make decisions.

The question is, if you put them into another setting where that's not part of the culture, then I don't know that they would sit around the table when they're trying to decide whether to buy, maybe really extreme, some piece of capital equipment, if they would – here's another example. So I, you know, I run this executive program for product managers. So I see like 350 product managers a

year and you would think that they would make every decision they make on the basis of customers because that's kind of what their job description is.

Q: Yes.

A: And yet, when you listen to them, that's not what's happening. You know, they're making it because it's technically feasible or they're making it because they think it will have an impact on market share or they're making it – like they're not – like when you had them fill out customer journey maps, they have a really hard time filling them out from the point of view of the customer.

Q: Interesting.

A: They fill them out from their point of view about what it is they're doing that they think has influenced what the customer's doing at each of the phases of the customer journey. So I think the answer to your question goes much beyond what I can influence in the classroom. And that's why I brought up Exec Ed because like I'll ask them in Exec Ed settings. I had a bunch of executives from Australia in earlier this week and I said, "When you make decisions in your company, is the customer, in effect, present at that meeting?" and, you know, they either look at me like I'm crazy or look at me with a little glimmer and say, "No," right? Because they're, you know, all day long, they're making decisions without bringing the customer viewpoint into that conversation.

Q: That's – yeah, that's great. That's fascinating. I'm curious, you've been using the word 'customer' throughout this couple of questions which is great. You know, when I'm on the design side and bringing this into, you know, the MBA classroom, I mean, I've been using the term 'user' then actually been shifting it to stakeholder which is sort of elaborated on early on. I never use the word 'customer' but all my MBA students use the word 'customer' and --

A: Well, I'll tell you why, because that gives them the money.

Q: Yeah. It --

A: Right?

Q: That was enlightening to me.

A: If I'm being thorough I say customer user but – and I'm starting to use stakeholders because if you think about innovation ecosystems blah, blah, blah, blah there's more than, you know?

Q: Absolutely. You talked about the employees and, you know, everything else. So – but --

A: Yeah.

Q: Yeah. I mean, you're spot on. That's the money trail – the customer.

A: Yeah. Yeah. Although, you know, I have to say product management program particularly the B2B folks they're really clear that they have many different whatever you want to call them, right, customers, stakeholders. They can articulate. We have users, we have the people who pay the check, we have the decision makers, we have, you know. All those stuff in Osterwalder's book they totally get that list of six or eight stakeholders. So, yeah.

Q: Yeah, that's terrific. Alright. Let's – we'll move to four which, again, sort of piggybacks on three and again, no right or wrong answer. We'll just elaborate and build on these previous conversations. Does increasing the understanding and use of design thinking have an impact on business decision making with respect to meeting user needs in a meaningful way? What have you seen, again, in your classroom whether it'd be Exec Ed, on the business side or just your straight MBA course in terms of creating more meaningful impact?

A: Yeah. The two elements of an answer to that, first of all, this is, I think, back to that how do you actually not skip over the insight thing, it's hard work to get to meaningful insights and it takes more in-depth interviewing than we can have

our students ever do. We tried last fall to have our students do a hundred interviews as a team over the course of the semester.

Q: How big is a team?

A: Five. They went nuts. They went nuts. We got the worst teaching ratings we've ever gotten at this course. And they still had incredibly superficial conversations with their customers. In fact it was probably worse because we had set this target. I was teaching it with a lean start-up guy. It's fine. I'll go with it. And not – what I learned is, the lean start-up guys don't get it. They don't understand the difference between a discovery interview and a test interview and so they're not teaching their students how to do discovery. They're just assuming that if I keep throwing things against the wall, eventually, 'something will stick' kind of model as opposed to 'Let me go, actually, deeply understand what my customer's lives are about and what's going on.'

So this is one of my great frustrations about teaching this stuff. Like a friend of mine at the d.school and I have this discussion often because our sense is that the d.school brings people in for a bootcamp and they have fun for the week and they leave with something and they tell them it's really good but it's not clear that very many of them are getting to insight. And I think if we keep teaching design as if it's just this cute little process when it's hard work to actually get the insights, we're doing a disservice. So the first question is, am I ever getting students to meaning? And I would have to say that – I'm trying to think of projects that have gotten to meaning. The projects that have gotten to meaning that mostly come to my mind were projects where students actually wanted to start a company before they even came in to the class.

Q: I see.

A: And so they were motivated to go out and actually really understand stuff.

Q: So in the service of entrepreneurship?

A: Yeah. Yeah. I mean, I haven't – I don't do many projects with students that are doing it for a large company because that has all kinds of challenges in itself. So

the – yeah. So the first challenge is how do you get to meaning? Like, how do you get them to a point where they're not just telling you, "Well, it should be easy to use and it should play four songs." Like, no, that's not meaning, that's functionality or that's, you know, usability but it's not an emotional connection, it's not a story that I go, "Oh. Oh, I get it." So to me, that's a first challenge and I – maybe I could put my other challenge in there at the same time which is, I guess it has to do with – yeah. I'll tell you. I'm writing a case study about Salesforce. Salesforce bought gravitytank --

Q: Yes.

A: -- and they're embedding it in their sales motion. And so, I'm trying to unpack what were the challenges in A, even getting Salesforce to invest in gravitytank but now, B, in really, really embedding it in the sales process. So what are the challenges of that?

One is, I think like when I tell the Huggies' story and I say, "Parents are anxious about toilet training," people say, "Well, duh. I'm a parent," like, you know, not very many parents got through that process without some challenges. So there's kind of this "duh" problem with the insights that belies the three months of work that went in to getting there because it's not like people just said that you had to hear it in a different way.

So a part of the challenge with good design thinking is, in the end, they package the story in a way that it sounds obvious, you know, like sure, the personal stage monitors. Well, that was three months of in-depth interviews with [] and right, following them around, observing them to understand that it wasn't about hearing protection, it was about stage monitors and creating a story around it that didn't look like hearing aids. But when you've done it on the other side, it looks like I should've just been able to figure that out. I don't know, did that answer the question? I forgot what the question was.

Q: It did. I mean, I think it's this notion of getting to meaning and what is it – how do MBAs interpret meaning. I go through the same struggle and, you know, we talk about going through the qualitative interviewing process and talk about trying to get to sixty-eight really, really good stories from the field and they literally think once they've done six to eight interviews they're done and I'm like, "Look, it's about doing many more than six to eight but it's about filtering down to six to eight." There's a lot of this that you throw away and getting them

to be disciplined about that in, really, an activity that can be ambiguous and uncomfortable, I have found it to be a struggle for my business students. It seems like I'm hearing similar struggles on your end.

A: Yeah. Yeah, they're not patient. I've been – a new approach I've been using is to have them read stuff about this and then have a discussion with one another about whether they've used it at work or, you know, how they could imagine using it, this kind of stuff just to kind of see. And so many of them will say, "Oh, it just takes too long." So the idea, it's just like design for manufacturability where, you know, you have to invest longer in the design process but then the manufacturing ramp is shorter. If you spend long enough like, if you spend three months getting the personal stage monitor story, the investment you make in changing your brand, changing your go-to market, developing the technology pays off big time because you figured out something that really matters but the students want the answer today and they come from companies that have rewarded them for that.

And so, having them step back – it's also – I don't know if you read – Cal Newport wrote a book called *Deep Work* in which he really makes the case against spending all of your time in shallow work, meaning answering emails all day long or just being responsive to fires that crop out. And he suggested our companies are overly driven by shallow work and that not having time to say, "I'm going to take an hour to think about what I should be delivering to the customer next" or to think about whatever your job is.

And actually, I was just talking this morning to a woman who works on the ramp at Southwest Airlines and she supervises ramp operations and she talked about a good day as a day when things run smoothly so I can spend time in my office planning a fun event for the next week or improving delivery of our safety communication or – right. She's talking about having a balance between deep work and shallow work.

I think our MBA students, so many of them come from an organization in which they've been rewarded for shallow work and they have been doing it for so long. This is partly, by the way, to not just blame them, right? I get that like my kids, they're all on their phones and all of their – but, you know, like my twenty-year old has figured out that if you want to do well in classes, you have to have deep-work time.

I think we're asking students to do deep work in a setting in which mostly, they don't have to. And so, when you say, "No, this requires really digging in and putting stuff on the walls and seeing if it sticks and--" I don't know if you're going to have the answer by the end of class today. It's so different than what they've been rewarded for doing and they aren't – the muscles aren't there. So I think this goes beyond whether we're teaching them design or anything else. So I think it all has to do with all this conversation about bringing Liberal Arts back into the curriculum, right, because Liberal Arts, by definition, require deep work like I can't read a book and think about it in one-minute snippets through the day, right?

Q: Yes. Yeah. It this --

A: So I think when you ask about this meaning and that kind of stuff, I think it has in part to do with where do I actually do the reflective observation work that's required to get there?

Q: I'll tell you that was – boy, you got me really thinking on that. That is terrific. I'm going to dig into this book, *Deep Work*. I'm fired up about it. I mean, I never put it in this sort of way, this deep work versus shallow work and allowing the time to sort of reflect and nurture these things but I see it all the time in my classroom. It's a great frustration for me and it's this notion of, what I see as instant gratification. Okay, I checked the boxes, I did the interview, here's the insight. It's shallow. I'm going to ideate. These ideas are not original and now, I've done design thinking and they walk away and then they come back to it. I've had more than a few students come back to me six months later and say, "Hey", you know, with some distance, they're now trying to apply it and they're trying to figure out what they really learned and what was the process and I said just because you didn't allow yourself enough time to be reflective. And the rigor in this in my opinion is in the journey and it's that nurturing journey and, you know, you can go --

A: But if you ask them to reflect, like we tried to have them write reflection papers two semesters ago.

Q: Yeah.

A: They make jokes about it.

Q: They do make jokes about it and I'm always dinged for it as a faculty member and even if I have them read something and have a conversation, it's very difficult. We actually had them actually use different creative ways to sort of share their reflections out and they just looked at it as a joke and they said, "Well, this doesn't feel business school-ish." You know, why would I create a sculpture or write a song or build something physical that reflects my journey? It didn't – because that's not the way they were rewarded in the business school here and at least, that's been my perception and I mean --

A: Exactly. I thought, you know, the ones that are the most interesting to look at are the exceptions to that, right?

Q: Oh, yeah.

A: Because they are, you know, maybe or something.

Q: They absolutely are.

A: And the questions -- and some of them are exactly what you were just describing. They came to business school as reflective people, right?

Q: Yes.

A: So they probably didn't come out of a consulting firm, they probably didn't come out of a hedge fund, because they came from someplace where reflection was a part of – was allowed and thus, they could practice it. Yeah.

Q: Yeah, I love it. It's a good transition into five and we can celebrate what's working potentially here. So question five, how have your business students learned design thinking best? If you can give me your success stories, that would be great.

A: Yeah.

Q: And question six, we can jump back into the difficulties.

A: Yeah. Well, I'm trying – sorry. I think I've been doing this too long and I'm discouraged so it's hard for me to – the best were probably teams where there was at least one person on the team who had some pretty disposition to like these approaches and help their teams come along with the process.

Q: They were able to keep the energy positive?

A: Yeah. I mean, they were able to help the rest of the team see – like one group had – I don't know, they just have energy as a team. They were looking at – I don't remember exactly what it was. It was a short project on -- but it had to do with drinking tea. And so, they went in pairs off to tea shops all over San Francisco and they began to really understand why people went to these places, you know. They didn't zero in on the kind of tea or the teacup or whatever, they really got that there was a context, a social emotional context. But they sat beside other teams in the class who didn't get it.

So my struggle here is sort of like, I don't know what to do to help them learn best because sometimes they seem to get it and sometimes, they don't. I don't – and I have the same situation you do where they come back six months later and tell me how much they learned but in the moment, I'm not guessing if they get it. So when you ask how they've learned best, I have like, no way to now that. It's funny. If you ask that, I'm like I realize that's – every year, I've tried to do something different with this class for seven years and I can't get my teaching ratings out of a place they've never been in any of my other classes or, you know?

Q: Right. So you rated the lowest in the business school and if you'd bring the same content to another, to the engineering school, you get a higher rating?

A: Yes.

Q: That's been my personal experience and --

A: And in Exec Ed.

Q: Yeah. Oh, an Exec Ed. Yeah, absolutely.

A: Right?

Q: Absolutely.

A: Right, but in the business school. So, you know, we've tried thirty-person classes, sixty-person classes, five coaches in the room, one faculty member in the room, project linked work, you know, just little exercise work and I honestly can't tell you what works best, you know? And then I say, is it me? Is it, you know? Am I just getting old and they don't like old faculty? I don't know.

Q: I don't think it's you. It's a very difficult audience. And I've, you know, gone through team teaching myself and it's not for everyone and I've had to warn people be very selective about it and it's difficult. Now on the flipside, it can be incredibly rewarding, right?

A: Yes.

Q: And you feel like you've moved the needle with people that can actually bring this dialogue and this content, you know, that can help you scale it significantly in the business world and that's what keeps me going but it can be a daunting challenge when you're the faculty member. That's been my perspective. I'm sensing the same from you.

A: Yeah. Yeah, it's been really – I remember the first year I was so optimistic I thought the students would fall all over and they would love it. So I was fairly astonished when they didn't. I would say that the classes that got the highest ratings for this, to me, watered the process down to d.school level meaning, it was kind of like 'Come have fun. Play a little game' and the students sort of thought it was fun, they didn't have to work very hard.

Q: Right.

A: But then I don't think they learn design thinking. So that's kind of.

Q: Yeah. No, I think that's fair enough. I'm – I understand the plate. Let's jump into question six. And again, we've talked about this a little bit. I'll read the question: What difficulties have your business students had in learning design thinking? And one of the things that we talked about was, you know, going out and doing, being rigorous about the interview in process and taking the time. That seems like that's been a difficult issue. Had there been other issues? I mean you talked about this notion of make and prototyping as an issue. But do you guys do like rapid visualization and story boarding and things like that? They are very hands on that they either struggle with. Or maybe they love that, I'm not sure.

A: Yeah, I often have them do skits because that's for most of them more comfortable than other kinds of sort of artistic work, if you will.

Q: Okay. But so these skits had been a positive?

A: Yeah.

Q: Okay.

A: Yeah, they're enough, sort of. I mean we have been – business students tend to be extroverts.

Q: Right.

A: They don't mind getting up. You know, with one percent of them testing out in the lower left hand quadrant, of the empathy quadrant, one of the biggest challenges – and I've tried multiple different ways to get around those, is we're dragging them from the fifty percent of them who were kitty corner to that,

right? I have an answer. No, but I have an answer. We're trying to drag them down to talk to other human beings and have empathy for them. And that's huge because we're asking them to do something that's like as far away as possible from what they are comfortable doing.

But I think that empathy quadrant – we used to have a student – last semester we found out, you know, we told them, "Do a hundred interviews." He didn't do any, even with the peer pressure of being on a team where you're supposed to be doing them, he didn't do any. He goes, "No, I don't do that stuff." So I mean these are great puzzles to me. "No, I'm just not going to do any."

Q: It's that because it's just so out of their comfort zone?

A: I think so. I mean I've actually had, now it's ten years ago, so I had a team in my new product development class. And they have this technology that they wanted to put in store fronts so you could project on to your store window. and from the outside, it would look like whatever you're projecting from the inside, you could see out. And they wouldn't interview shopkeepers. You have to do that. And then I would say, 'Well, how about do this, just walk down Piedmont Avenue and take photos of the store windows on the other side of the street and then walk down the other side. And then brings those photos in and sort them. Just so we can see like what are the categories of things that people are doing with their store windows now.

Q: Yes.

A: They just wouldn't do any of that. It was my first time, I think, with a team that wouldn't do it. Some of this, you know we could get all in to the or whatever. We could get into the they're so they're used to communicating in other forms that face to face is just like not what they do. But even business people, like you try teach them some Product Management. And they're like, "Ask people about their feelings?" I said, "You don't actually have to ask them about their feelings because if you ask them to tell you a story, you'll know their feelings." Anyway, the number of students who will go – and they asked them how they felt. "You think to yourself, 'how many times do I have to say no.' No, don't ask what they felt." If I walked up to you and asked you how do you feel, that's weird. Like come up with a better way to –

Anyway, so I think empathy is huge. I think that's a huge difficulty for them. I think it's hard for them not to converge too fast. And I think part of that comes from flying through that insights quadrant where they're not really stepping back and saying, "What assumptions am I making? And could I break them?" And that's an industry orthodoxy, this thing, like how do you get people to say, "What if that assumption didn't hold? What might I be able to do?" I think they have a lot of trouble with that piece of it like actually seeing things.

And that's probably related to – they've already converged. So they heard their customers say something and while they're listening to the customer, they're coming up with an answer. This is a classic like you know with your kind of thing. You don't have to fix it all, just listen. So I think that's sort of there's something in there between converging and not questioning enough.

And then I think that they're just slow to move. It's not so much about making stuff. I have to say, you know, I can give them pipe cleaners and fabric and they'll make stuff. In fact, some number them have a hidden maker instinct or whatever. So it's about whether they're willing to show that thing to someone else.

Q: I see. I like that.

A: Because it's not, right? No, it's not about making. I can get them to make and there's almost always someone on the team who is willing sketch or something like that, right? Like you can kind of get them there, but it's getting them to take it back out. I had one team do that really well last semester where they understood the notion of testing pieces of a customer experience you're trying to create. Before they test the whole thing. And I convinced them. They did it. But that's really hard. Probably not as hard as the empathy work in the first place. And they don't want to pivot also, right? You know what I mean? I don't have time to pivot. There's that inability to let go of their answer.

Q: Okay, that's terrific! I'm curious when you talked about sketching. And you said that you had a – you often have one or two people in a team that like to sketch or visualize. Do you actually – when you have all 250 students who are required to do research, to go out there and do research, do you have all 250 actually sketch and storyboard?

A: Sometimes, not usually for the output of the group. It depends. Some of the stuff I use – I think I've gotten so frustrated that I stopped doing stuff that – like I would have them generate concepts and everyone on the team has to bring in somewhere between ten and twenty concepts. And I make them sketch those and bring them in. So that would be a case where I would make everyone do it. I'm thinking more about when they're building a shared prototype, where it's more of a collective output, that's where I was thinking about the sketching.

Q: I see, okay. That's great, thank you! Let's move to question seven. What have you found to be the ideal environment for business students to learn design thinking? So can you give me like a description of your classroom where this is happening? Like current state. And then what would you like to see from a future state?

A: Well, we're lucky because about seven years ago around the same time we started teaching this, well no, five years ago, we had a couple of years of scrambling to find dorm room lounges we could teach those classes. It has to be flat with tables and chairs that move. And ideally, it has wall space for each team to work on in whatever form that takes. We were lucky that we got money to build our innovation lab, which is an open classroom with cubbies that have floor to ceiling whiteboards. So I mean you know all that stuff. So we have that kind of a space which is way, way, way better than our stage on the stage classrooms.

And the first year I taught this class, we taught it in the only flat room we had which is sort of an auditorium, is you will that we use for speakers. But it's a flat – and I bought a roll of butcher paper for each team. So I had fifty rolls of butcher paper in my office. And I would roll the rolls of butcher paper over to the room for every class. And the teams would get them out and unroll them. And that would give them their little bit of their continuous visualization, if you will, of their project. I have to say I kind of miss that. I don't miss rolling the rolls of butcher paper.

Q: But this idea of having students visualize and put content up on the walls is important?

A: And it's still there next week, right? See what we do now is they give each team a bi-fold of foam core. But it's not actually the same as that butcher paper. I like the butcher paper, I think because it felt less precious, they would just unroll

some more and draw on it. Whereas on the foam core board, we don't let them draw directly on it because we reuse it because it's kind of expensive. So and it's – I hadn't thought about this, those rolls of butcher paper where they could just keep going.

Q: Yeah, I like that.

A: Like, "Oh, that design didn't work, let's try another one." And we've tried shifting to having them capture what they're doing on a Weebly site. So we give them the structure of the Weebly site and then here's what we expect to see on it. But once they take a photo of an image on the board, as you well know, it's gone, right? It is now not changeable. Whereas when they had their rolls of butcher paper, I now hold these pictures of them sitting around on the floor, with their rolls of butcher paper. And they would build business model canvasses with blue tape. And if they didn't like it, they build another one. Then they tape all their --

Q: This notion of less precious, you have found to be very valuable?

A: Yup.

Q: And did it resonate with the students?

A: Well, see that was the first year I did it. And actually to say at some extent, they were the best involved that you're a lot of years in this class. But they trust me and anyway. It made it more physical because they were kind of sitting around their butcher paper, as opposed to sitting around a table and just talking at each other.

Q: Right, with their laptops open.

A: Yeah, even worse. And they had an ongoing engagement with their past artifacts, which is different than the foam core board. It's different than the

Weebly. It's like – they did pack it up and put it away at the end of every week because I kept their butcher paper, for lack of any place to store it.

Q: That's great. Okay, well maybe we can go a little bit deeper on that with question eight. So what elements of the design thinking process have you found to be valuable for business students to learn? Obviously, you were emphasizing this notion of upfront insights driving the empathy. They're struggling with that. But have they seen the value in it?

A: I think some number of them have, yes. I think they – I think once you go out and talk to one or two people, you get over your fear doing that, you get over your fear of not having the right answer before you go talk to people, etcetera. So the ones who are willing to do that I think that has been valuable. The other thing that I think has been valuable for some number of them is diverge-converge.

Q: Can you tell me a little bit more about that?

A: So the way I teach is I call it, the 'dynamic balance', diverge: generate options, converge: select options. Can't do both at the same time. So be clear about when you're diverging, and when you're converging. They usually --

Q: When you're converging – I guess so when you're diverging, the set up to that is the insight or 'how might we' question. And you're diverging with a wide range of ideas.

A: Yup.

Q: What is the catalyst for you to make the switch to now converge? I mean is it going back and using that insight as the guardrails for them to come back to? Or are there certain tools or techniques that you're using?

A: Yeah. That, I thought a lot about this, too. I like to 'make a great bowl of chili metaphor', right? And I use that all the time. My friend that teaches at the

d.school. I do stuff with him a fair amount. I've watched him do a concept generation session with like corporate executives where he builds a concept with them, partly because he can sketch really well. So he goes up to the wall and he just starts sketching. This is what the drive through should look like. And people are throwing out stuff. And they're all building on it. And I've done other projects with him where he always wins the prize for the most interesting idea coming out of his group. If he's facilitating a group, he always wins.

Q: Because he's completely immersed in the process and he's doing it with them real time?

A: And he's bringing them into it and he's building a great bowl of chili. He's not focused on making sure that every possible meat that might go into chili or every possible vegetable is on the table, which is what diverging is when he brainstorms, kind of, right?

Q: Right.

A: He's less worried about getting all the info on the wall that can be there. And more on, "How do we pull them all together into something interesting?"

Q: I see.

A; And I don't know how to teach that. So I still just teach – I talk about a great bowl of chili. And every once in a while a team really, really gets it. You know and like I'll go and all "I'll have them do that probably just a little too kind of narrow stuff down." But then I'll say, "Take all the ones that have dots on them. Put them over here, and tell me if any of them go together. Like if any of these create a more interesting overall solution." I would love to come up with another way to do that, honestly. And I probably just haven't done enough research to figure out how other people do it. But I think we're a little too clinical about it.

Now, if the question is, 'what types of customers should we be asking?' Yeah, throw a bunch of post-its up there, cluster them and then figure out which ones you're going to go talk to, right? Like there's times when the diverge-converge using just straight post-it note stuff is the way to go. There are other times like

when I'm trying to design the drive-thru for a fast food restaurant where it's like you need morphological analysis or the kinds of stuff that we used to teach in New Product Development. Here's all the ways so I can take an order. Here's all the ways I could hand the food out the window. Here's all the ways I could move the cars around. Like there are so many things going on. Then I have to mix and match them all. You know, that's kind of the 'great bowl of chili' thing. And frankly, we don't teach any of that stuff in design thinking. We just go, "Okay, you got your homework? We now come up with a bunch of ideas." If an idea has any complexity to it. That just doesn't actually work.

Q: Yup, agreed.

A: Especially when we're talking about designing customer experiences. It's like, "Eeh." I mean we should probably do morphological analysis on the elements of the customer experience or something. Anyway.

Q: Yeah, okay, we'll wrap it up with number nine. And really just to bring it all home. I mean what, in your opinion, is the value of design thinking to business students? I mean if you have to boil it down into – what are they getting out of this?

A: Here's how I try to frame it. Recently, more than ever, there's so much stuff out there now about digital transformation. I don't think there's a single industry that is not going to be radically transformed in the next ten years. And these students have to be part of that. And they're not prepared to be part of it if they can't adopt the mindset that we try to teach them in design thinking.

Q: Because that mindset is enabling them to be more empathetic towards stakeholders? Is that where that's going?

A: I probably would have started with that mindset allows them to identify and discard inappropriate assumptions, right? I mean I think it's really about – if you ask me that, I probably would have said that first. I think – it's all this stuff about disrupting belief in the McKinsey article, like other orthodoxies, so much of that stuff is getting turn on its head, right? I mean I often bring up Travis Kalanick as a great example of a systems thinker, he may not be a great example of empathy and other things. But he is a great example of a systems thinker. Where he is looking at Uber came and grew because he got that there are a

whole bunch players in this ecosystem that had to be managed, structured, facilitated, worked around in order to make Uber work. And he was willing to put stakes in the ground around that, right?

So I think that a lot of what we're trying to teach has to do with really being able to frame and reframe what am I trying to accomplish? Now, that's where I linked this to customers. I used to start with technology's changing really fast but I think digital transformation is a part of that. Technology is driving that. But I use stuff like we'd moved from extracting commodities, making goods, delivering services, experiences, right? They argue that guiding transformations as the next step. And I use the story about a guy, Sal Khan, it's the story Sal Khan told when he was on campus. You know, this guy, bad student in high school, wants to get a Computer Science degree, goes on Khan Academy, watches videos twenty times if he needs to learn the stuff that way, right, goes to college. That's a transformation. So here's one other thing I put out there. I don't know if you know about Black Mirror?

Q: No.

A: Like a Netflix. It's totally dystopian view of the world with technology in it. The Circle by Dave Eggers is another example of that. So in Black Mirror, like every one rates every one and every interaction in one of the episodes or you can implant a chip so that we would have perfect memory, is another episode. Like it takes things we're already doing and says, "What if we keep doing these things?"

So it becomes a question of what kind of world do we want to live in? And I think all these things are related. I think we are teaching the students who are going to create the world that we're all going to live in. And if they're going to design that world, then they need a different way of understanding it and looking at it. And that's not what we typically teach in business school. So yes, it does have to do with empathy. It's the combination of what kind of life do we all want to live, right? And what are the orthodoxies that exist today that have to be disrupted in order to move to that life is one way you could look at it.

The other way you could look at it is all this stuff is getting disrupted and we've got Travis Kalanick in charge of designing the future of transportation. Is he the person we want to have in charge? Not clear his employees are that happy with that, not clear his drivers are happy with that. So how do we not all become

Travis Kalanick. That's a little bit of a dark way of putting it. That's kind of how I think about it.

I try to construct it in a more – you know if we can help people live to be 200 years old, how do we go about thinking about that? And a lot of this stuff is having it -- this is part of what I think is so cool about Salesforce Ignite. They are out helping their customers restructure their organization in service of their customers. So now all of a sudden, they're out basically teaching people how to be more customer-focused using information technology to do that. That's a future that I like.

Q: Right.

A: Right? So to me that's kind of what this stuff is about. I just don't think the leaders of the future have a choice but to do the Daniel Goleman thing. I've got to have inner focus, other focus, outer focus. And inner says I've got a set of values and I know what they are. Outer is empathy, cognitive and emotional. And I mean 'other' is empathy. And 'outer' is systems understanding. And so that's kind of how I think about what we're trying to develop. And I think the successful leader of the future, if we don't have a lot of really messed stuff going on, it's going to have those elements. But you know that's another old person's view of 'kids today are designing things'.

Q: I don't know, it was pretty good. It was pretty good.

A: It's huge amounts of change, right? And we could design really messed up education systems or we could design education systems that are really help – like we could just take everything we believe in today. But let's grade on a curve, only let you take the test once. Let's have everything come in chunks of four years, and semesters, right? Or we could step back from it, say, if we really wanted a lot more people to be better educated, how would we go about designing that?

And I think our students are too willing to say that this is how it works today, and I'll automate that." As opposed to, "How could it really work?" So to me, that's what I would hope the students would care about. I don't know if they do, some of them do. Some of them just come from places where it's easier for them to imagine going back and working by the rules. I have a son like that, right? I

mean one of my sons stares at me like, I just want to know where I'm going to be and what I have to do. I'm like really, did I raise you?

Q: I'm curious, this is not tied to any of the questions but it maybe connects to the mindset, I have seen – and I actually had students tell me this, business students here at Kellogg talk about the value of their social network within the business school, being in certain cases, more important than the classroom learning. And that I just find mind-boggling because it really points to this closing ranks sort of mindset. But I'm seeing it more and more. And I see it in the classroom. Literally, it goes back to this point of, "Hey, I don't have time to go out and do a hundred ethnographies." And I said, "Well, you've got three weeks to do it." "Yeah, but I'm in all these club activities and I am the moderator of this panels," and it's all about collecting these social engagements, building that currency over the rigor of the journey of what we're trying to do. And design thinking, my perception is that you don't get good at this by taking one class and checking the box. It's doing it over and over again. And in fact, a lot of the learning comes through the failure of the experience. And that seems to fly right in the face of where they're coming from.

A: And then they take a second class in it. And they go, "No, I've seen all these before."

Q: Yeah.

A: You know, like, "Well, you're not very good at it for having seen it before." Yeah, I know we have that problem. I mean people ask me if they should go to business school. And I'll say, "Well here's the reason to go to business school. One, you could learn something. Two, you're going because you want to build a social network, right? Three, you want to change careers and you have to step out of one before you can step back in to the other." And I was like, and I'm not sure learning shows up on the list of some number. It does some. I mean I've had some push back on me when I say that. "No, I really came here because I wanted to learn accounting or finance or whatever." And often, unfortunately, the people who say they came to learn are probably the ones who are better at design thinking but they have no background in the hardcore modeling analytical work of business school. So they're actually there to learn that stuff. And the ones who are engineering undergrads and want jobs and all that kind of stuff, they don't want to deal with the design thinking stuff because that's squeaky, weird.

Q: It’s soft, it’s fuzzy.

A: Yeah, well, and it’s uncomfortable. So it’s a funny – I don’t know. I think a lot about whether or not we should even be bothering. You know, there’s a lot of people out there who are learning design in a whole bunch of other settings. And maybe they’ll just take all the jobs that we need to have done by people who can think that way. So I don’t know.

Q: That’s interesting.

A: In my dark days.

Q: Yeah, I know, I hear you. I think we’re a small group that’s trying to get this done in the business school. And I think we’ve all had dark days. One of the things I wanted to share with you, when you were talking about the rolls of butcher paper, I found that really interesting. I remember doing that as a professional many, many, many years ago. We’d roll out these continuous rolls and we even called it, ‘brain scrolling’ because we had this big scroll, and you can see all these ideas going across. One of the things that I’ve been doing for my students is the class is kept at thirty because that’s a manageable number, for me at least. And in teams I had originally selected the teams myself based on their background. I found that to be disastrous. So they self-select into the their teams.

A: They don’t like that.

Q: And I give each time one of these, literally right out of art school, a large black portfolio. And in that portfolio, and it has a color-coded tag on it for them, in that portfolio is loaded with I think three or four of those sort of giant 3M post-it note pads. So there’s three of those – they’re expensive – but there’s three or four of them each of the portfolios along with new rolls of scotch tape, fresh sharpies, and lots of post-it notes. And that becomes their portable design studio. And that allows them to do that work and put those large sheets up in their dorms or wherever they’re at, their meeting rooms in the business school. And they can take them down, stack them and they bring them into my studio. And then they put it all up. And it allows them to actually put content up, but also take it down and take it with them. That’s worked really successfully. Maybe that’s something you want to look at doing. It’s not inexpensive. But I found it

to be pretty successful. I've done it now for four years in a row. And it's been pretty good. But there is cost to those materials.

A: Right.

Q: So, I don't know, just something I want to share with you.

A: Well, buy all the foam core board. So maybe you could send me a [] or two.

Q: Yeah, I will. I will.

A: That'd be super helpful.

Q: Absolutely.

A: Yeah, because we teach all these applied innovation courses as well. And I think they all have the same problem. And we sort of jerry-rigged that something that just isn't quite there.

Q: Yeah, and it's – and the other thing is that, I, for right or wrong, I allow them to do nothing digital in the classroom. So all the presentations, I call it, 'paper point'. Everything is paper and it's all movable. And it's all up on the wall. So I do it in a 3R studio setting. So I'll lecture and introduce some new tools and techniques and give some examples for half an hour to an hour. Then we'll go around and we'll do these paper points. And then I'll have the students who are not presenting for feedback to be active listeners. And all have post-it notes and sharpies in hand. And they're building and asking questions. And then they're tagging them on to the paper point on the wall. So that allows them to be interactive. No laptops are open. And we're standing most of the time for at least an hour and a half in the classroom, which can be exhausting. But it forces them to be engaged. And then we'll sit down in the back half and practice some of these new tools. And then maybe do some skits or some prototyping. And then they go out in the field after that class and utilize those tools for the next

deliverable. That would be brought back in via paper point in the next week. I've had some success with it.

A: That's great! You know, you're making me realize, because I've been co-teaching this with my lean start-up guys. And they're the opposite. You know, they've got a whole platform, lean launch pad platform. And the stuff up in it. And it's flat. But I need to go back to where I started maybe.

Q: I did a lot of – we did readings, we did reflection pieces, we did little workshoppy things, sort of d.school. And I get where you're going with in terms of, "Does that feel rigorous enough?" And then cases, because I was – I don't know, I felt like I was trying to skew it more towards something that I thought the d.school would like. And I was just getting torched in my reviews. And I said, "You know what, I'm going to break this down and go back to being a designer." And this is how I would do it in a design studio. And I'm getting much better attraction. Now, it feels super foreign. It absolutely does. And I have folks that just come in skeptical maybe they're feeling a little bit better but they're not in love at the end. But I think for the most part, I've been able to have greater success by doing it this way. And just being completely different in the delivery, the activation and how the students deliver than anything that's happening in the B school. And right down to that sort of big black portfolio. Like it's so big you can't lose it. It's tagged with all their information. If it gets lost, you know they carry it with them. And it does work. It kind of works.

And the other is that I'm providing them with all the materials they need. So I also give them little sketchbooks, little journaling pads, because I don't want to have any of those, the physical things to be an excuse. So I'll put them in their hands and say, "Okay, let's go and get to work." I'll take some pictures and send it to you.

A: I'll just take some of your class and redo mine.

Q: I mean I'm having some success. It's not – it's still – I think like anything, these are always works in progress. And that's part of why I'm doing Ph.D., is to try to learn from others, and figure out how to make something that maybe others can use. And I'm happy to share with anyone what I've been doing. And I'll send you some images of these of sort of the classroom, what it looks like and what the portfolios are all about.

A: That would be great. Yeah. I could use some inspiration.

Q: The other thing that I do is I haven't done anything in the class as per entrepreneurship. I'm a little nervous about that like having all these students try to start something. So I do actually tie the class to a corporate, not necessarily a challenge, a collaborator because the other thing is I'm emphasizing doubling down on the whole desirability piece. But what I found is the students, they get bored quickly. And they want to see how to make it viable or feasible. So I feel like if I don't have a nod to that, I lose them in the class. By bringing in an organization and setting it up right, that "Hey, look, we're not here to do free consulting for you. But if you can give us some frameworks around your business that can help, even make desirability more impactful, all the better."

So last year, I worked with Harley Davidson. And the challenge was broad. It was looking at what could be generational relevance for their brand going forward. That was one challenge. And then the other one was around, "What does the new premium experience look like for a new generation of Harley enthusiasts?" So they were broad enough, but yet they give us a sense of purpose of where to go and how to discover things. And we've been tying a lot of our project-based work to millennials, quite honestly because that's who they are. They're passionate about it. And they can actually tap that network very, very quickly. And so because I don't want them to get hung up on like, "Well, who do I talk to? Or where do I go?"

And I've done things in healthcare – you know, healthcare is exciting to me but you know it's a nightmare trying to get access. And so if I can streamline it to an audience that they're familiar with, even though I would like them to be uncomfortable, they're still uncomfortable talking to each other. I can get it moving. And that has worked. Now, you mentioned that doing this with these partners comes with its own set of complexity. And it does, trying to find the right partner and get the right information. That is difficult. But I will say, I've had some success the last couple of years. And I've been able to leverage that.

So this year, I'm teaching a class in two sections. And one, we're going to do customer experience for United Airlines. And literally, going to roll the tape of the guy being dragged off the plane. And like, "Here's our challenge." What does this look like for United and how can we be more conscientious and human-centered around it?" And the other one is like a digital retail play for UnderArmour. And I was able to get it both of those because I was able to say, "Look, this is what we did with Harley Davidson. And the year before that, we did it with a restaurant brand called, "Protein Bar." And the year before that, we did it with the innovation group for the YMCA Corporate. And it was all around understanding membership and community. And they brought us a sense of

realism. That was good because you need some of those constraints. But it also was very conscientious that the students need wiggle room to reframe and actually shape what those opportunities are.

A: Yeah, that tends to be the biggest challenge.

Q: It is.

A: They get really convergent around something they think the company would like as opposed to.

Q: It’s funny one of the learnings I had from the Harley Davidson piece is that the students all wanted to go to Harley Davidson dealerships and talk to Harley Davidson customers. And I said, “Guys, think about the challenge. We’re trying to understand what would the future is for generational relevance. We don’t want to go back and talk to Harley.” Harley knows who Harley is. We need to understand what’s important about ridership and community and technology for folks that are not interested in Harley. And the students were like, “Whoa! I never thought about that!” I’m like, "The last thing you want to do is go to a Harley dealership because I don’t believe you’re all that interested in riding a $24,000 motorcycle that you have to buy, by the way, from a dealership out in the suburbs and go to the Grand Canyon. Like that’s an old model for Harley Davidson." And so having some of that information from an organization has helped us. It’s still complicated to do. But it’s been helpful.

A: May we have a lot of – all of our design innovation classes do that. So part of the challenge for me is just one unit.

Q: Yeah, no I understand.

A: Part of it…

Q: You're sort of the set up as it goes into it. Yeah, I get it.

A: Yeah. It's just not clear.

Q: This class that I'm talking about is actually class – the name of the class is called, "Research-Design-Build". I went through a bunch of different titles for it. And I said, "I'm just going to make this as clear as I possibly can. Here are the things that you're really doing and practicing in it." And you can interpret what 'build' means. I mean I could build a business model canvass or build something in foam core, I don't care. It's all about working and shaping the narrative. And so trying to be very pointed on that. And then let that challenge run through the entire course. So the first half is research, middle: design, build, and then obviously there's overlaps. But we work it throughout all ten weeks of the class. We hit the ground running class one.

A: Yeah, that's kind of how we used to do a new product development. Sometimes we would have industry challenges.

Q: They're exciting. But it could be problematic.

A: Well it is fun just to work on different things. I've banned bicycle locks for my classes because I've been to too many of those.

Q: Well, Sarah, I've taken so much of your time. And I want to let you go so you can have the rest of your day.

A: It's always good to talk with you.

Q: But thank you so much! I'll send you some photos and some information on how we're doing it. And please feel free to use anything I can send your way.

A: Oh, that would be great! Yeah. Just be good to be inspired to.

Q: I think we are a small teaching community. We need each other.

A: Exactly.

Appendix Q

Academic Member Interview Coding

Code 1:

Within your business school institution, is design thinking taught as part of the core MBA curriculum?

AM 1: Not part of the core MBA.

AM 1: All design courses are treated as electives.

AM 1: Course titles vary.

AM 2: Part of the core MBA.

AM 2: The course is a half credit module.

AM 2: Course title is “Problem Finding, Problem Solving.”

AM 3: Part of the core MBA.

AM 3: The course is a half credit module.

AM 3: Course title is “The Innovator’s Perspective.”

AM 4: Part of the core MBA.

AM 4: The course is a half credit module.

AM 4: Course title is “Innovation, Design, and Entrepreneurship In Action.”

AM 5: Part of the core MBA.

AM 5: The course is a full credit module.

AM 5: Course title is “Design Thinking and Management.”

Code 2:

Is design thinking an important part of a 21st century business school education?

AM 1: Yes.

AM 1: Innovating rapidly in a competitive and complex marketplace is critical.

AM 1: An innovative culture within organizations is critical to the relevancy of business.

AM 1: Innovation is a function of creativity and execution.

AM 1: Finding the right problem to solve is critical for innovation.

AM 1: A major value proposition of design thinking is about problem finding and framing.

AM 2: Yes.

AM 2: For business students, design thinking needs to be part of the consideration set for critical thinking.

AM 2: Observation is fundamental to critical thinking.

AM 2: Understanding and using emotional empathy and cognitive empathy are fundamental as an innovator.

AM 2: Problem identification and framing are fundamental.

AM 2: Skills on the "How Side" are fundamental while skills on the "Why Side" are critical.

AM 3: Yes.

AM 3: Design thinking is a discovery driven type of problem solving that is a weakness of business students.

AM 3: Business students struggle with the ambiguity of design thinking and the uncertainty of the discovery process.

AM 3: Complex problems are ambiguous.

AM 3: Business students struggle with empathy.

AM 4: Yes.

AM 4: Design thinking brings a different set of tools to the business school environment.

AM 4: Design thinking brings value in solving ill structured problem that require skills beyond core analytical business coursework.

AM 4: Design thinking is usable in some but not necessarily all circumstances.

AM 5: Yes.

AM 5: Not all business students embrace design thinking and more importantly innovation, discovery, and creation.

AM 5: Design thinking is a way to connect elements of business such as strategy and marketing.

AM 5: Design thinking connects teams and people to real problems that matter.

Code 3:

Does the introduction of design thinking to the curriculum of business students improve their understanding of user needs in their decision making?

AM 1: Yes.

AM 1: Ultimately, design thinking is about finding the right problem to solve.

AM 1: Design thinking emphasizes the user and the user experience, and this is why design thinking is a human-centered methodology.

AM 1: The human-centered approach is different from a traditional business approach which is rooted in analyzing, rather than discovery.

AM 1: Design thinking "a-hah" moments are spurred by actual emotion.

AM 1: Business approaches often lack "a-hah" moments of emotion.

AM 1: Business approaches often miss how people actually feel both positively and negatively.

AM 2: Yes.

AM 2: Often, business students lose sight of customers when making decisions because they are so focused on the feasibility and viability of the business model.

AM 2: Design thinking gets business students closer to understanding customers in a

way that is unfamiliar and uncomfortable for them.

AM 2: Design thinking can only be successful in business curriculums and business organizations if the approach is used beyond niche applications.

AM 3: Yes.

AM 3: The human-centered approach often comes off as a "truism," in that business students often think they do consider user needs.

AM 3: The difficulty is getting business students to realize the extent to which they don't fully understand a human-centered approach and the depth that is required to actually do meaningful work that leads to meaningful outcomes.

AM 3: In order for business students to actually understand and embrace this human-centered approach to decision making some level of discomfort needs to be created.

AM 3: This level of discomfort allows for students to actually realize specific needs and particular realities that they were not fully aware of.

AM 3: Business instincts are not always the same as human-centered instincts.

AM 4: Yes.

AM 4: Ethnographic methodologies are not emphasized and are not fully understood by business students.

AM 4: Design thinking brings a whole new set of tools to better equip business students to understand people and context better.

AM 4: There is nothing more fundamental to design thinking than developing a deeper set of insights into the needs of whoever you're designing for.

AM 5: Yes.

AM 5: A design thinking approach is critical for innovation. However, business schools seem overly enthralled with entrepreneurship and especially lean startup approaches.

AM 5: Business students who focus on entrepreneurship and lean startup approaches are often in a rush to move through the development process without going deeper in the understanding of people.

AM 5: We are all connected as people and without digging deeper we can never truly understand or gain empathy.

AM 5: Business students struggle with digging deeper, going beyond the obvious and such, often fail to understand and use empathy to inform decision making.

AM 5: The value of design thinking is beyond surface application.

Code 4:

Does increasing the understanding and use of design thinking have an impact on

business decision making with respect to meeting user needs in a meaningful way?

AM 1: Yes.

AM 1: Design thinking is a way for business students to ultimately make better decisions by quickly immersing themselves in the situation and getting familiar at a visceral level of exactly what the situation is.

AM 1: Design thinking allows business students who may not necessarily be an expert, to really deep dive and get smart quickly but understanding, interacting and observing people that you're trying to innovate for.

AM 1: Design thinking is directly connected to understanding users better, creating better customer experiences, and fostering an innovative culture.

AM 2: Yes.

AM 2: Business students often have surface level conversations and observations in the research phase of design thinking.

AM 2: Gaining meaningful insights takes hard work and is often a more difficult process than business students realize.

AM 2: Digging deeper in the design thinking process is a skill that business students are not necessarily prepared to do. It's very different from how they are rewarded in regular business classes.

AM 2: MBAs are not necessarily patient, and they often spend a great deal of time doing shallow work and not deep work.

AM 2: Creating opportunities for business students to be motivated to go beyond the obvious will be critical for their adoption of design thinking.

AM 3: Yes.

AM 3: Increasing the understanding and use of design thinking for business students, is complicated and success is not automatic.

AM 3: The pedagogy that is required for the adoption of design thinking for business students needs to be designed around them (who are they, where are they starting from, what are their biases, what are their weaknesses).

AM 3: Business students often consider themselves to be the smartest people in the group and they have come to school from a place where they have succeeded. As such, they feel that they are good problem solvers.

AM 3: Business students often solve the same type of problems and use methodologies that fit better into less obstructive sets of problems. They often use an analytical approach that does not necessarily equip them to understand user needs in a meaningful way.

AM 3: Design thinking is human-centered and can provide business students a different approach to innovation that is empathy driven.

AM 3: Teaching business students to be more human-centered requires a different pedagogy than what they are familiar with in business school.

AM 4: Yes.

AM 4: Design thinking provides business students with data that they have uncovered and which is driven by the needs of the users.

AM 4: Developing ideas from contextual data is different than developing ideas from statistical data. Both are important, however, contextual data may inform more meaningful or better outcomes.

AM 4: Business students are able to build a certain motivation through empathy, which comes from deep qualitative research.

AM 4: There are different points in the process where qualitative and quantitative data can work very well in the decision-making process. It's about balance and depth.

AM 5: Yes.

AM 5: Business students often see design thinking as a surface level value.

AM 5: In order to truly understand people in a meaningful way, it's all about practicing design thinking beyond a surface level application.

AM 5: There needs to be greater focus on depth and problem-finding within design thinking education for business.

AM 5: If business students can identify the real problem behind the perceived problem, they can closer to developing more meaningful ideas.

AM 5: The focus on craft and process can only lead to basic solutions.

AM 5: Without depth, you are only making surface level decisions that most likely will as meaningful as originally expected.

Code 5:

How have your business students learned design thinking best?

AM 1: It's all about learning by doing.

AM 1: Design thinking is not simply an intellectual exercise that could be understood through the business case-study method of learning.

AM 1: Learning through practice is a dramatically different approach for those used to the way business courses are traditionally taught.

AM 1: It's important for business students to be put into real world situations outside of the classroom to learn design thinking best. Context of the environment is critical.

AM 1: Further learning comes from open discussions and the consequences of what actually happened or what might happen.

AM 1: Design thinking learning comes from the learned experience.

AM 2: For business students to learn design thinking, it's difficult on many levels.

AM 2: Learning in the context of small teams is critical.

AM 2: Project linked work brings the learning into context.

AM 2: Small sprint exercises gets students familiar with material.

AM 3: The short answer is practice.

AM 3: Students need to be put through some sort of struggle so they realize they actually don't have the answer.

AM 3: Struggling creates an openness for them to be willing to accept something different.

AM 3: Moments of insight happen when you're struggling and you try something different and it works. The only way this can happen is through actually putting the students in a situation where they actually have to act on something.

AM 4: Business students learn design thinking best when they have to apply it in the real world.

AM 4: The case-study method, which is commonplace in business school education, does not put the students into a real world contextual situation.

AM 4: The case-study method can provide business students with a baseline understanding of the design thinking approach. However, learning happens best when design thinking is applied and practiced through projects.

AM 5: Business students learn design thinking best through a studio context.

AM 5: Design thinking needs a space which is not perfect or polished, allowing for work to be done and ideas to be shared.

AM 5: It's important that the studio is a place where the faculty can coach and mentor students in an environment that allows for both conversation and critique.

AM 5: The studio environment somehow feels less threatening and more collaborative, allowing for feedback in a way that a regular classroom cannot.

AM 5: Teaming is critical for students when learning concepts, such as design thinking, which they are not familiar with.

Code 6:

What difficulties have your business students had in learning design thinking?

AM 1: For most business students, design thinking is radically different from most all classes they have taken in the business school.

AM 1: For business students, it is not always evident exactly how design thinking will be used in the classroom and later in the work place.

AM 1: Business students struggle to utilize design thinking outside of the studio bubble, where everyone has a shared level of experience, language and tools.

AM 1: Business students often come to design thinking with interest but skepticism.

AM 1: Design thinking must be directly connected to business and business outcomes in the classroom.

AM 2: For most business students, the empathy quadrant is difficult for them to understand and master.

AM 2: Understanding people and gaining empathy in context for many is as far away as possible from what they are comfortable doing.

AM 2: Business students often converge too fast because they move through insights too quickly without stepping back and being reflective and digging deeper.

AM 2: Business students struggle to see things because they have difficulty moving past their own assumptions.

AM 2: Business students often have an inability to let go of their own ideas and as such empathy, sharing ideas for feedback and pivoting are difficult.

AM 3: The cynical business student minority is very difficult to manage in the

classroom.

AM 3: Design thinking content cannot simply be designed for the most enthusiastic student.

AM 3: Large blocks of studio time that are commonplace in a traditional design school setting — are not commonplace in business school. The majority of the business students' coursework is delivered in a lecture-style format — that doesn't allow for other format times (such as studio time) to exist in their schedule.

AM 3: The rhythm required in design exercises, tasks, and sessions feels different and less rigorous than what business students are familiar with, through the majority of the non-design business classes that they are taking.

AM 3: Most business students default to a divide and conquer type of approach to work which is the opposite of what is needed to learn design thinking.

AM 4: Most business students are inherently uncomfortable with ambiguity.

AM 4: Conducting ethnography, in which business students have to engage directly with people in deep conversations, is challenging.

AM 4: Teaching business students, who are often data driven, to be hypothesis driven is difficult to do if the students struggle with or refuse to understand and gain contextual empathy.

AM 5: Business students often default back to what they know and are comfortable with.

AM 5: Business students are often caught up in proving something to be right through quantitative data, rather than going through the discover process.

AM 5: Invention and creativity is difficult for business students because it's out of their comfort zone and is different from all other management coursework they do.

AM 5: Creativity can be taught. However, many business students are not open-minded to learning it.

AM 5: Overall, it's the baggage that comes with business that is most difficult for business students to overcome when learning design thinking.

Code 7:

What have you found to be the ideal environment for business students to learn design thinking?

AM 1: Bringing design thinking outside of the classroom and into contact with real organizations is important. This gives design thinking a business context that students can relate to.

AM 1: Business students appreciate examples of companies which did not have a design thinking reputation but were able to use design thinking to transform and generate great results.

AM 1: The classroom is a great environment for practicing design thinking before you get out into a real environment and utilize it.

AM 1: The classroom is important because it allows students to bring together insights and reflect.

AM 1: Ideally, you need to have relatively small student teams.

AM 1: The ideal class size is 24 students with multiple members of a teaching team.

AM 2: Design thinking is best learned in a flat classroom with flexible furniture that allows for teaming.

AM 2: Wall space is critical and ideally you want floor to ceiling white boards for students to share and build ideas on.

AM 2: The work of design thinking needs to be made visible in order to be collaborative.

AM 3: A flat classroom, which is opposite of a typical MBA tiered lecture-style classroom, is important for learning design thinking.

AM 3: Students need to have the flexibility within the learning environment for small group teaming and critique.

AM 3: Business students tend to work best in self-selective teams of 4 to 6 members.

AM 3: At least 50% of design thinking work needs to be done outside of the classroom.

AM 4: Design thinking does not take a lot of fancy stuff. However, it's stuff that most business schools don't have, namely flat space that allows for teaming and creative collaboration.

AM 4: The ideal team size for students to learn design thinking best is 4 to 5 members.

AM 4: Ideally, you want multiple people with real skills that can work in the classroom with the individual teams.

AM 5: Ideally, it comes down to flexible space that is messy and allows students to experiment and make things.

AM 5: Making things is important because it forces students to work through a problem.

Code 8:

What elements of the design thinking process have you found to be valuable for business students to learn?

AM 1: It all starts with actually framing what is design thinking and how it differentiates from other processes that are taught in business school and practice in the business workplace.

AM 1: Framing design thinking as problem finding and problem solving is fundamental.

AM 1: Demonstrating that design thinking is an innovation process that helps business students create a methodological way of finding the right problem to solve through a human-centered approach and that is different than what is emphasized in operations management. Not better than, but different.

AM 1: Emphasizing that design thinking is not simply a creative process but rather a framing process (what's the problem you're trying to solve, who is the person you're trying to solve it for, and what is their context).

AM 1: Design thinking is often described as creative problem solving, and while that is important, it is more important to think of it as a creative way of finding the right problem to solve in the first place.

AM 1: Design thinking can enable business students to step back from jumping directly into the solution space.

AM 2: Business students who get over the fear of talking to people in context, in a deep and thoughtful way, often find that to be the most valuable aspect of design thinking.

AM 2: Learning how to think and act in a divergent and convergent manner can be

valuable in the way you generate and select options.

AM 3: We are bringing things directly from design into the business classroom, however, we should never expect or insist that business students become designers in the traditional sense.

AM 3: Teaching the importance of empathy and human-centered approaches connects business students to the core concept of humility.

AM 3: Contextual understanding and uncertainty in a qualitative setting is unfamiliar to business students and yet fundamental in shaping the value of humility in their thinking.

AM 4: All of them.

AM 4: Business students need help in scoping problems because they tend to define them too obviously and too narrowly.

AM 4: Business students struggle with ethnographic research and difficulty synthesizing raw data and converting that data into actionable insights.

AM 4: Business students often generate superficial insights which lead to obvious solutions.

AM 4: Business students are used to doing something once and thinking they have the right answer. Design thinking insists on multiple solutions that if created through deep

insights can generate better ideas.

AM 5: All elements of design thinking are important for business students to learn.

AM 5: Most importantly, is the ability to find a problem that is important and has meaning to people, and the ability to generate a hypothesis from which the generation of many ideas can come from.

AM 5: Business students often get hung up on the first solution, spending all their time polishing one idea.

AM 5: Critique is fundamental to design thinking but is something that business students often resist.

AM 5: Learning comes through discover, reflection, and critique.

Code 9:

What is the value of design thinking to business students?

AM 1: Most business students come out of school with a set of knowledge on how to run a business. Real value comes from being able to balance a strategic mind set with creativity, and to feel confident in the ability to take individual creativity and scale that creativity across an entire enterprise and to build a creative culture within an organization.

AM 1: In order to truly call yourself an innovation leader, you must have a balanced perspective that incorporates quantitative business school skills with creativity and creative leadership that is learned through design thinking.

AM 2: With design thinking comes a mindset that allows business students to identify and discard inappropriate assumptions. This is fundamental in the pursuit of innovation across industries that are transforming.

AM 2: Design thinking enables business students to frame and reframe what are the most important problems to people and how to solve them.

AM 3: Humility.

AM 3: Understanding the importance of greed and being open to devoting the time to empathize with and connect with real problems.

AM 3: Understanding the natural tendency of an organization is to not be open and experimental and that in order to radically differentiate, different types of approaches will be necessary for an organization to be innovative and deliver innovation.

AM 3: Understanding that there is a role for design in business and that design is not simply a tactic such as graphic design.

AM 4: The value of design thinking is that it provides a new toolkit and philosophy which is human-centered and not taught or understood predominantly in traditional

business school curriculums.

AM 4: At the front end, design thinking enables discovery of new knowledge which informs problem framing, the generation of many ideas, experimentation, and testing. All of which inform decision making.

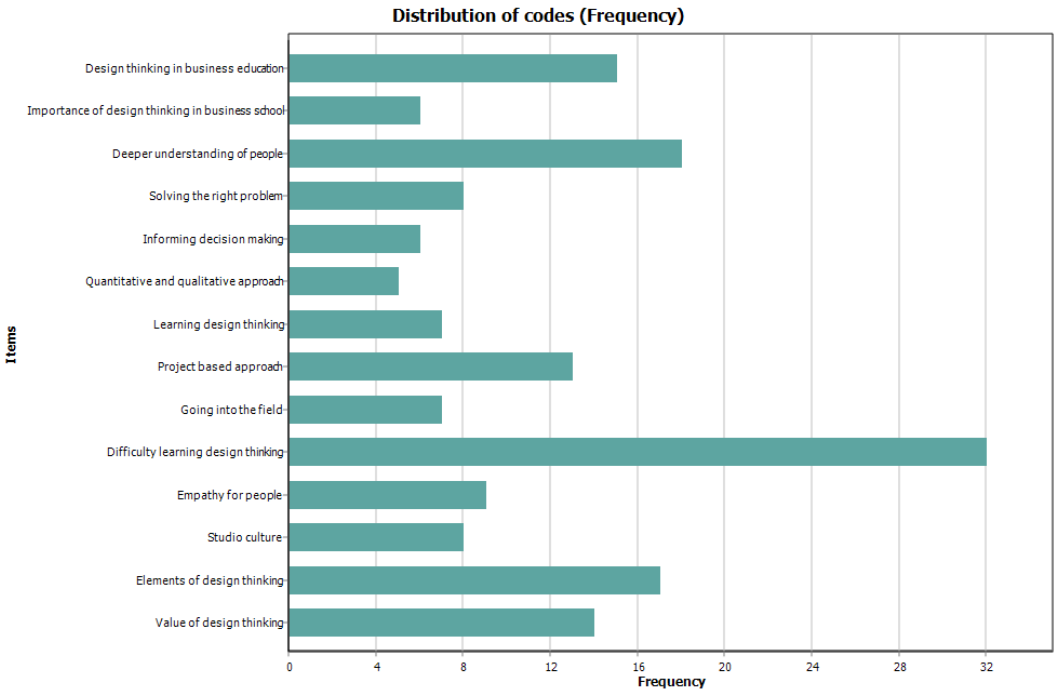
AM 5: Design thinking is valuable in the discovery and creation of services and experiences.

AM 5: Design thinking has a role in business and when you have students that can actually integrate and use these skills together with business skills, you have future business leaders that can make a real difference in the world.

Appendix R

QDA Miner Academic Member Interview Data

Category	Code	Count	% Codes	Cases	% Cases
Education	Design thinking in business education	15	9.10%	5	100.00%
Importance	Importance of design thinking in business school	6	3.60%	5	100.00%
Deeper Understanding	Deeper understanding of people	18	10.90%	5	100.00%
Problem Finding	Solving the right problem	8	4.80%	3	60.00%
Decision Making	Informing decision making	6	3.60%	4	80.00%
Quantitative and Qualitative	Quantitative and qualitative approach	5	3.00%	4	80.00%
Learning	Learning design thinking	7	4.20%	3	60.00%
Project Based	Project based approach	13	7.90%	5	100.00%
Field Research	Going into the field	7	4.20%	5	100.00%
Difficulties	Difficulty learning design thinking	32	19.40%	5	100.00%
Empathy	Empathy for people	9	5.50%	4	80.00%
Studio	Studio culture	8	4.80%	4	80.00%
Elements	Elements of design thinking	17	10.30%	5	100.00%
Value	Value of design thinking	14	8.50%	5	100.00%


Distribution of codes (Frequency)
Design thinking in business education
Importance of design thinking in business school
Deeper understanding of people
Solving the right problem
Informing decision making
Quantitative and qualitative approach
Learning design thinking
Project based approach
Going into the field
Difficulty learning design thinking
Empathy for people
Studio culture
Elements of design thinking
Value of design thinking
Items
0
4
8
12
16
20
24
28
32
Frequency

Category	Code	Case	Text	% Words
Decision Making	Informing de	Academic Member 3	They fill them out from their point of view about what it is they're doing that they think has influenced what the customer's doing at each of the phases of the customer journey. So I think the answer to your question goes much beyond what I can influence in the classroom. And that's why I brought up Exec Ed because like I'll ask them in Exec Ed settings. I had a bunch of executives from Australia in earlier this week and I said, "When you make decisions in your company, is the customer, in effect, present at that meeting?" and, you know, they either look at me like I'm crazy or look at me with a little glimmer and say, "No," right? Because they're, you know, all day long, they're making decisions without bringing the customer viewpoint into that conversation.	1.10%
Decision Making	Informing de	Academic Member 1	what you want the [] experience to be and in order to do that, you have to understand where, you know, what's the as-is experience, what are all the challenges and needs that comes out of that as-is experience. And	0.70%
Decision Making	Informing de	Academic Member 1	the insights are spurred by, you know, the actual emo, you know, considering kind of the emotional responses of this research, right	0.40%
Decision Making	Informing de	Academic Member 1	But with design thinking, you know, you, it allows people, even if you're not an expert, to really deep dive and get smart quickly by kind of understanding, interacting and observing with the people that you're trying to, you know, identify [] for, but also, you know, [] all around just kind of seeing what the experience is like. So, it's really a way for people that ultimately make [] decisions later on down the road to quickly immerse themselves in the situation and get familiar at a very visceral level of exactly what the situation is.	1.60%
Decision Making	Informing de	Academic Member 5	"Empathy is critical to design thinking, but you need to go deeper and you need to go beyond the obvious. So again, yes…using design thinking as part of the business school curriculum can help inform the decision making of students if it's practiced in a way that is deeper than simply a surface application."	5.80%
Decision Making	Informing de	Academic Member 4	Well, what it does is give them data to ideate with; that is, data driven by the needs of users they've uncovered.	0.30%
Deeper Understanding	Deeper unde	Academic Member 3	They fill them out from their point of view about what it is they're doing that they think has influenced what the customer's doing at each of the phases of the customer journey. So	0.30%
Deeper Understanding	Deeper unde	Academic Member 3	They're just assuming that if I keep throwing things against the wall, eventually, 'something will stick' kind of model as opposed to 'Let me go, actually, deeply understand what my customer's lives are about and what's going on.'	0.30%
Deeper Understanding	Deeper unde	Academic Member 3	And so, they went in pairs off to tea shops all over San Francisco and they began to really understand why people went to these places, you know. They didn't zero in on the kind of tea or the teacup or whatever, they really got that there was a context, a social emotional context. But they sat beside other teams in the class who didn't get it.	0.50%
Deeper Understanding	Deeper unde	Academic Member 3	But even business people, like you try teach them some Product Management. And they're like, "Ask people about their feelings?"I said, "You don't actually have to ask them about their feelings because if you ask them to tell you a story, you'll know their feelings." Anyway, the number of students who will go – and they asked them how they felt. "You think to yourself, 'how many times do I have to say no.' No, don't ask what they felt." If I walked up to you and asked you how do you feel, that's weird. Like come up with a better way to –	0.80%
Deeper Understanding	Deeper unde	Academic Member 1	It's, you know, taking a step back, starting with the, you know, the user understanding what the context is for the user and identifying what the needs are and finding the right problem to solve	0.60%
Deeper Understanding	Deeper unde	Academic Member 1	You know, what is, it puts that at really the heart of everything. You know, it's why they call design thinking a human-centered methodology. And it all starts with, you know, what the, you know, what you want the [] experience to be and in order to do that, you have to understand where, you know, what's the as-is experience, what are all the challenges and needs that comes out of that as-is experience. And really to be able to do that, you know, again, with the human-centered perspective, you have to really narrow down and define who it is that you're designing for.	1.80%
Deeper Understanding	Deeper unde	Academic Member 1	who is the person that you're trying to solve for, what is their context	0.20%
Deeper Understanding	Deeper unde	Academic Member 5	"It is this idea of deep thinking, or deep understanding that is fundamentally lacking in business schools."	1.80%
Deeper Understanding	Deeper unde	Academic Member 5	"Empathy is critical to design thinking, but you need to go deeper and you need to go beyond the obvious	2.10%
Deeper Understanding	Deeper unde	Academic Member 5	"Again, it goes back to the notion of going deeper. Thinking deeper and understanding at a deeper level	1.90%
Deeper Understanding	Deeper unde	Academic Member 5	it goes back to digging deeper and truly understanding people	1.00%
Deeper Understanding	Deeper unde	Academic Member 5	Business students need to understand that in order to solve problems for people, they need to go out and understand people in a deep way. That can only be done through contextual practice."	3.40%
Deeper Understanding	Deeper unde	Academic Member 5	Without any depth, you are only making surface level decisions that most likely will not be as meaningful as you had hoped.	2.30%
Deeper Understanding	Deeper unde	Academic Member 5	"You can't realize the value of design thinking without working harder and going deeper."	1.60%
Deeper Understanding	Deeper unde	Academic Member 4	I can't think of anything much more fundamental to design thinking than developing a deeper set of insight into the needs of whoever you're designing for	0.40%

Category	Code	Case	Text	% Words
Deeper Understanding	Deeper unde	Academic Member 4	So the first set of insights is usually pretty superficial, which means your ideas are going to be pretty obvious. So the more students push deeper into their insights, the better the quality of the ideas they will produce, but they need to have the discipline to keep going back and revisiting and trying to push themselves to a deeper place.	0.80%
Deeper Understanding	Deeper unde	Academic Member 2	And so, if you teach it well, absolutely they really end up with a much higher level of humility and understanding of the need to be human centered in what they do. If you don't teach it well, they will say, "yeah, I already knew this in some way and I was already doing it," and it might even reinforce some bad habits.	0.80%
Deeper Understanding	Deeper unde	Academic Member 2	And so, when I talk about being human centered, what I mean is this: whose problems are we trying to address? Whose lives are we trying to improve? And never forgetting that it's not about me making money but it's about sort of as a reason, but if I do end up making money it would be as a consequence of really improving somebody else's life in a substantial way. And that person whose life we're trying to improve is a human being who has very specific needs and very particular realities. And if we start from a deep understanding of those needs, those realities, we're much more likely to develop a solution that truly works for them, and not something that sounds great to us but that doesn't necessarily solve the problems that we say we're going to solve. Does that make sense?	1.80%
Difficulties	Difficulty lea	Academic Member 3	one is in the one-unit class where they don't really have enough time to work on a meaningful project	0.20%
Difficulties	Difficulty lea	Academic Member 3	for the evening/weekend students because they have fulltime jobs, it's really hard for them to spend time together to do teamwork so we try to spend the three-hour, you know, class sessions having them have a lot of time in their teams and guide them through application of the tools and techniques in their teams, which implies a fair amount of coaching availability typically if you have sixty students or twelve teams in a classroom at any given time.	0.60%
Difficulties	Difficulty lea	Academic Member 3	The question is, how do you teach individual skill development, for example, interviewing and the use of design techniques, in teams? And I feel like finding the right balance between those two is really complicated because well, just in terms of time if nothing else, I mean, I thought about just teaching an entire course of this around individual skill development, like how do you observe and notice? How do you frame and reframe? How do you step back from a problem, frame and reframe it? How can you generate alternative ideas? Imagine and design yourself like generate ideas? And then how do you make an experiment? Can you build a prototype of something? Can you try something out on someone else? All those four are really individual skills that then have to be practiced in teams.	1.10%
Difficulties	Difficulty lea	Academic Member 3	having to work in teams outside class is just really difficult, you know, particularly in multi-disciplinary classes where the students, you know, from the Design Department may be on a completely different schedule than MBA the students.	0.30%
Difficulties	Difficulty lea	Academic Member 3	teaching people to get to insights, to get to why, to frame and reframe a question is super, super important and hard.	0.20%
Difficulties	Difficulty lea	Academic Member 3	I think that's a standardized testing problem that we just trained a lot of students to come to the one and only answer. So that's important, and then making and experimenting – this is probably the other thing that's hard for students; is to be willing to try something out before it's finished.	0.40%
Difficulties	Difficulty lea	Academic Member 3	I'm not sure I would say that engineering students – you see, the problem is that all the kids who come to UC Berkeley did really well on standardized tests. Fifty percent of them test out in the upper right hand quadrant as converging learners, so that's – at least for engineering and business students, that's particularly true	0.50%
Difficulties	Difficulty lea	Academic Member 3	The question is, if you put them into another setting where that's not part of the culture, then I don't know that they would sit around the table when they're trying to decide whether to buy, maybe really extreme, some piece of capital equipment, if they would	0.40%
Difficulties	Difficulty lea	Academic Member 3	And yet, when you listen to them, that's not what's happening. You know, they're making it because it's technically feasible or they're making it because they think it will have an impact on market share or they're making it – like they're not – like when you had them fill out customer journey maps, they have a really hard time filling them out from the point of view of the customer.	0.60%
Difficulties	Difficulty lea	Academic Member 3	it's hard work to get to meaningful insights and it takes more in-depth interviewing than we can have our students ever do. We tried last fall to have our students do a hundred interviews as a team over the course of the semester.	0.30%

Difficulties	Difficulty lea	Academic Member 3	they're not patient. I've been – a new approach I've been using is to have them read stuff about this and then have a discussion with one another about whether they've used it at work or, you know, how they could imagine using it, this kind of stuff just to kind of see. And so many of them will say, "Oh, it just takes too long." So the idea, it's just like design for manufacturability where, you know, you have to invest longer in the design process but then the manufacturing ramp is shorter. If you spend long enough like [], if you spend three months getting the personal stage monitor story, the investment you make in changing your brand, changing your go-to market, developing the technology pays off big time because you figured out something that really matters but the students want the answer today and they come from companies that have rewarded them for that.	1.20%

Category	Code	Case	Text	% Words
Difficulties	Difficulty lea	Academic Member 3	I think we're asking students to do deep work in a setting in which mostly, they don't have to. And so, when you say, "No, this requires really digging in and putting stuff on the walls and seeing if it sticks and--" I don't know if you're going to have the answer by the end of class today. It's so different than what they've been rewarded for doing and they aren't – the muscles aren't there. So I think this goes beyond whether we're teaching them design or anything else. So I think it all has to do with all this conversation about bringing Liberal Arts back into the curriculum, right, because Liberal Arts, by definition, require deep work like I can't read a book and think about it in one-minute snippets through the day, right?	1.10%
Difficulties	Difficulty lea	Academic Member 3	Anyway, so I think empathy is huge. I think that's a huge difficulty for them. I think it's hard for them not to converge too fast. And I think part of that comes from flying through that insights quadrant where they're not really stepping back and saying, "What assumptions am I making? And could I break them?" And that's an industry orthodoxy, this thing, like how do you get people to say, "What if that assumption didn't hold? What might I be able to do?" I think they have a lot of trouble with that piece of it like actually seeing things.	0.80%
Difficulties	Difficulty lea	Academic Member 3	Because it's not [], right? No, it's not about making. I can get them to make and there's almost always someone on the team who is willing sketch or something like that, right? Like you can kind of get them there, but it's getting them to take it back out. I had one team do that really well last semester where they understood the notion of testing pieces of a customer experience you're trying to create. Before they test the whole thing. And I convinced them. [audio challenge] I said, "You don't even have to write the whole thing, right that [] just brute force, text people. It has to do with [] management and []. Text people." They did it. But that's really hard. Probably not as hard as the empathy work in the first place. And they don't want to pivot also, right? You know what I mean? [] don't have time to pivot. There's that inability to let go of their answer.	1.30%
Difficulties	Difficulty lea	Academic Member 3	You know, like, "Well, you're not very good at it for having seen it before." Yeah, I know we have that problem. I mean people ask me if they should go to business school. And I'll say, "Well here's the reason to go to business school. One, you could learn something. Two, you're going because you want to build a social network, right? Three, you want to change careers and you have to step out of one before you can step back in to the other." And I was like, and I'm not sure learning shows up on the list of some number. It does some. I mean I've had some push back on me when I say that. "No, I really came here because I wanted to learn accounting or finance or whatever." And often, unfortunately, the people who say they came to learn are probably the ones who are better at design thinking but they have no background in the hardcore modeling analytical work of business school. So they're actually there to learn that stuff. And the ones who are engineering undergrads and want jobs and all that kind of stuff, they don't want to deal with the design thinking stuff because that's squeaky, weird.	1.70%
Difficulties	Difficulty lea	Academic Member 1	Yeah, and I think there's a number of difficulties. You know, first of all, it's, for a lot of business school students, this is, you know, radically different from classes that they've taken before. It's also not a, it's also something that's not apparently evident exactly how it's going to [] because, you know, there's a certain notion of what you need to know and a certain way you do things with an MBA and that brings that into []. And then there's, and then there's, and even if you learn the skill sets of design thinking in terms of how you would think differently and how you would actually practice things differently. The impact of bringing that into an organization that might not have that mindset is going to vary, right?	2.30%
Difficulties	Difficulty lea	Academic Member 1	Yeah, I think what we've tried to do is we've tried to move, you know, and if you think of the introductory classes, you know, just the basics of design thinking, you know, what is the process, what's the methodology, what's the technique, we're trying to introduce content which is more, you know, the advanced topics of how do you implement and how do you transform organizations with design thinking. You know, what is the organizational psychology around design thinking? You know, how do you do change management in the context of bringing a creative culture into organizations?	1.70%

Difficulties	Difficulty lea	Academic Member 1	Yes. That's the number one misconception about design thinking. Everybody thinks about design thinking, if you were to ask a room full of people to design, to define design thinking, I would say that 90% of people would say it's creative problem-solving. And I would argue, it's, no, you know, there's some of that, but, you know, the more important thing is, you know, creative ways of finding the right problem to solve in the first place, you know.	1.40%
Difficulties	Difficulty lea	Academic Member 5	However, not all business students embrace design thinking and more importantly, invention, discovery, and creation	1.60%
Difficulties	Difficulty lea	Academic Member 5	"I often find that business students are simply in a rush to check the development boxes along the way without really giving the proper time needed to go deeper in the understanding of people. You can never truly gain empathy without digging deeper…this is critical."	4.80%
Difficulties	Difficulty lea	Academic Member 5	thinking…but business students often shy away from critique…they don't like to be wrong	1.70%
Difficulties	Difficulty lea	Academic Member 5	Business students default back to what they know and what they feel comfortable with. They're often caught up proving something to be right through data — rather than discovering	3.00%
Difficulties	Difficulty lea	Academic Member 5	Business students often see design thinking as a surface level value	1.10%

Category	**Code**	**Case**	**Text**	**% Words**
Difficulties	Difficulty lea	Academic Member 4	Absolutely. I mean, most of them are inherently not all that comfortable with ambiguity. They really do think there's a right answer and we just haven't told them what it is. So the ambiguity makes them uncomfortable. The – doing ethnography makes them uncomfortable. I mean if you probably let people text people on their phones, they might be OK, but the idea of going – of having to go out and find people to talk to and then engage people you don't know in pretty deep conversations about the issue you're trying to resolve, all of that is challenging for them, and then even texting. I mean as data-driven as our students are and as good with data as our students are, what we normally do, I think, in most business applications is we teach students to take the data they've got and answer questions with it whereas in design thinking, we're reversing that and trying to teach them how to be hypothesis-driven.	2.40%
Difficulties	Difficulty lea	Academic Member 4	And becoming hypothesis-driven is not easy, even for senior managers who are accustomed to taking the data they've got. So – and hypothesis-driven decision making is not unique to design thinking. I've taught it for many years in an elective on strategy consulting I used to teach and students struggled with it then. So I think in almost everything of a process other than like the basics of brainstorming – which they get and enjoy, and that's all fun – but both the frontend with the ethnography and the backend with the design and gathering of data, they struggle with both parts.	1.40%
Difficulties	Difficulty lea	Academic Member 4	Yeah. I mean, I don't think it's business school students. I think everybody does it. Your first pass at insight tends to be superficial. I mean maybe if you work for a design firm and you're very good at it, your first pass is deep, but when you take people who haven't been trained in it, their first pass is going to be superficial, for the most part, and helping them to see how to push beyond the superficial level into deeper insights is really critical if you want the quality of the ideas they produce to actually improve	1.40%
Difficulties	Difficulty lea	Academic Member 4	So the people that are there, they're all there and they're excited about it and want to be involved, and they uniformly work hard. In any required class, there's seventy people in the class and at least ten of them really resent the fact that you're there – they're there, and it could be a lot higher than that depending upon the class and the subject, and they really impact the quality of experience for everyone, right. Not just themselves but for the students who want to be there, I think they make it less of a fun, engaging experience. So required classes, it doesn't matter; it's the same in strategy. Whenever you're in the required part of the curriculum, it's a different feel than when you're in the elective part of the curriculum, but of course, it's usually the ones who need it the most that you're actually teaching in the required portion of the curriculum.	2.30%
Difficulties	Difficulty lea	Academic Member 2	And so, I think that when you're trying to teach this as an intellectual enterprise, some of the things sound kind of like truisms and some of the things sound like things that people—again, people hang their hat on things that they want to hear. And so, they hear that you need to be user centered or that you need to be human centered and really focus on human needs, and they're like, "yeah, of course, I do that," and they don't realize the extent to which they don't.	1.10%

Category	Code	Case	Text	% Words
Difficulties	Difficulty lea	Academic Member 2	Sure. So, a couple of things. One, I think we have to just start from the premise—this may not be true for all business schools, but for "our business schools," meaning the business schools that are attracting truly tough talent, we have to start from the premise that our students are kind of used to being one of the smartest people in their group [], there's a reason why they're here and there's a reason why they got into the schools. There's a reason why they're pursuing an MBA and they come from a place where they succeeded in the past as students and their early career work trajectories. So, they feel rightly that they're good problem solvers, they have done a great job of solving problems so far. Except the majority of them have solved the type of problems, sort of the same types of problems and with certain mythologies that kind of fit better into the kind of less obstructed set of problems. Imagine a company that's operating with a business model that's already working and has some issues with it and requires some improvements. That's a perfect type of problem for an analytic approach. A lot of our engineering students come from that world, for example. And they've been pretty good. So, number one, they start from a premise that they're pretty good, and they're correct, they're super smart and they've done a great job so far. And so, the notion that they need to learn to solve problems is kind of foreign to them because they are pretty good already. So that's one example of the types of things we need to think about for our students. Second, if one of the core principles of what you're labeling "design thinking" is having a truly open and truly sincere empathy for humans whose problems you're trying to solve, and our students probably know [] one of the strengths if they tend to be on the opposite of the spectrum. They actually tend to feel a little bit uncomfortable when you talk about emotions and about connecting with others in a deeper way. That's not their zone of comfort. It actually brings them discomfort. So that's another way in which their starting point is not necessarily an openness to this. And by the way some of them even think that letting things like emotions enter into the picture [] their ability to solve problems. So that's another kind of starting point that they have. And so, what I mean by automatic is that again, if you try to teach these things just as an intellectual pursuit where you just give them—even as a case discussion—if you just give them the material either in a lecture or in a case where it's all about rationalizing and analyzing what these concepts are about, they are going to "get it," they're going to understand it intellectually, and it's very easy for them to think that they already do this well. And so, what I mean by automatic is that just by showing them the information they're not going to get it. And that's where the pedagogy of these things is radically different from the pedagogy of other things. When you teach DCF you show the concepts, and people understand the concept and they get it and they can do it, and that's all you need, right? It's just about sharing information and showing data and ensuring that people understand data. That's not true in this case. I think that they can rationally believe that they already do some of these things, but actually they can trick themselves into thinking that they understand something, again because of their starting point. And so that's kind of what I mean by "automatic." And that's what I mean by this requiring a different type of pedagogy. I don't know if I'm making sense. I am speaking in very abstract terms.	8.10%
Difficulties	Difficulty lea	Academic Member 2	And so that's kind of what I mean. It's this idea that empathy requires humility and requires openness to not knowing what you're talking about as you're talking about somebody else's needs. And both as individuals but especially as members of an MBA classroom, they do not feel comfortable showing that kind of humility and ultimately, they really don't. So that's kind of what I meant.	0.90%

Category	Code	Case	Text	% Words
Difficulties	Difficulty lea	Academic Member 2	I would say there are kind of two or three types of issues that I constantly am battling in my classroom. One is, there's always a cynical minority who's very difficult, if not impossible to bring into the bus. So, if this is a bus and we're all going to a particular destination, and different from an elective, when you're teaching the core class, one of the things that I worry most about is keeping as many people as possible on the bus. And so, a lot of the content that I find cannot be designed for the most enthusiastic students but actually for, let's say, the median to the left of the distribution of students who are not convinced that this is a good thing for them and they're kind of like thinking about getting off the bus and I have to convince them they should stay on the bus. And the challenge is that there's always this small minority of students who are going to do their best to convince everybody that this is bullshit and that they don't understand why they're being forced to take this class. And the difficulty with them is that because they start from a cynical place, it's hard to get them to do the exercises sincerely, and if you don't do the exercises sincerely you don't get to realize that this is something that you could benefit from and therefore kind of all of the content does bug you. You get too superficial in understanding the content and so you end up just not absorbing anything. And depending on who these students are and depending on how you manage the class, if you don't contain them—it's a small minority but if you don't contain them—they can contaminate everybody else. And so that's one of the things that teaching this as a core class in a business school is always going to be a challenge. The second thing that is always going to be a challenge is that the rhythm of the types of exercises, the types of tasks, the types of sessions—kind of need to follow it from rhythm than everything else that they do [] in school. And so that's another challenge, it's like a timing challenge. It's difficult because if I could design my class in an unconstrained way, it would probably follow a very different meeting schedule, but I don't have that freedom because it's a core class and it has to fit within the rhythm of everything else that's happening at this school. So that's just another challenge, sort of breaking up and distributing the different teaching moments they want to bring to our class in a way that fits within the MBA schedule is not a trivial thing to do, and it's certainly another one of the challenges that we face.	5.90%
Education	Design think ication	Academic Member 3	Yeah. It has been – we have included it as a one unit – well, it's complicated. We – for the fulltime MBA students, it's a required one-unit class that sets them up to apply design approaches in their three-unit Applied Innovation courses and they are required to take one of those, at least one of those, while they're in the two-year program. And we've been doing that for, I think, seven years now that that's been required. So we call it Problem Finding, Problem Solving which is our version of a mash-up, really, of design thinking, lean start-up, a little critical thinking. So for the fulltimes, it's a one-unit class. For the evening/weekend students, we've gone through a number of iterations but it's now a really sort of a three-unit class that combines a little bit of Problem Finding, Problem Solving, a little bit of a project and then a like a weekend retreat where they apply the approaches to various kinds of problems. And then for the executive MBA program, we deliver it to them in the form of a required 1-week immersion experience. So we have sort of maybe half classroom time and then half time spent visiting innovation centers in local firms as well as design firms so they get a sense of the industry as well as the approach. And then I have about a third of them who take a follow-on Advanced Innovation course where they work on their own projects based on the stuff that they learned in the immersion week. So the answer is yes and that has been part of all three of our primary MBA programs now for like seven years.	2.30%
Education	Design think ication	Academic Member 1	Yeah, I think officially it's not a required part of the MBA curriculum. There are several design classes, design thinking classes that are offered, either, you know, directly just from the business school or people can easily go and go to the d.school in Stanford to take the classes. But, yeah, I mean, officially, I'm not sure, but I don't think it's part of the core curriculum of anything here.	1.20%
Education	Design think ication	Academic Member 1	I mean, it's kind of in between. So, the way that the Stanford d.school works is that there are faculty that are affiliated with the d.school and then there's also the opportunity for, you know, almost anybody to teach a course and, they have to go through a vetting process, but, again, it can be a d.school course. So there are a number of business school professors that are associated with the d.school and there are, you know, business school courses with business school course numbers that are also d.school courses. So, you know, technically, students can stay within, you know, just the business school and take business school courses, which are, which are design thinking d.school courses. But, yeah, I think for the most part these are elective [].	2.20%
Education	Design think ication	Academic Member 5	"Fundamental to modern business education, yes. However, not all business students embrace design thinking and more importantly, invention, discovery, and creation."	2.20%

Education	Design think ication	Academic Member 5	"Design has a role in business and when you have students that can actually integrate and uses design thinking and business skills together, then you have something special. It's those students, who have the capacity to integrate, that can make a real difference in the world and I think that's really important."	5.60%
Education	Design think ication	Academic Member 4	Right now at the Darden School, we've created a new class called "Innovation, Design and Entrepreneurship in Action", which does use the design thinking methodology as its core approach to what is really experiential field project work that the MBAs do in teams.	0.60%

Category	Code	Case	Text	% Words
Education	Design think ication	Academic Member 4	Well, I think the primary driver was to create more of a hands-on experiential course that would challenge students to deal with less structure and problems than they often get in the MBA program. So in this case, design thinking is really used as a structure to help students figure out what to do with this unstructured problem.	0.80%
Education	Design think ication	Academic Member 4	Well I mean, I think it's important to keep in mind that it isn't really billed as a core design thinking course. It's billed as a core project experience course that uses design thinking. Q: I see. A: So I think if you talk to most of the faculty, they wouldn't say that they primarily passed the design thinking course. They'd say that they passed an experiential course that the teaching faculty of that course then decided to use design thinking as the backbone of.	1.30%
Education	Design think ication	Academic Member 4	I think the reality of it is is our coursework right now doesn't teach ethnography in the required curriculum anywhere, and that – and I think that's changing in places, and there's a – there may be more of that, but certainly previously, a toolkit for diagnosing user needs that's really not been a prominent feature of business school curriculum already. So in that case – and certainly in our case at Darden – I think we bring a whole new set of tools to students around user needs that they haven't been exposed to before in overkill.	1.40%
Education	Design think ication	Academic Member 4	Yeah. I think it replaces it in certain decision contexts. So I don't think they're necessarily used together all of the time. They can be in particular circumstances, but I mean, I think it's an addition to the toolkit. In some ways, it's not philosophically complimentary; it's quite different in how it views the people you are designing for and how – in what sequence you consider the needs of the organization versus the needs of the person you're designing for. So in some ways philosophically, I think it challenges the toolkit that we're teaching in the rest of business school, but I mean the more – the broader, more diverse a toolkit, the better. The question is, "Can they figure out which tools they should use when?"	1.80%
Education	Design think ication	Academic Member 2	It's a complicated answer in the sense that it's not taught explicitly as design thinking, like we don't ever say, "well, this is design thinking and this is how we're going to teach it," however, the principles of design thinking are incorporated in kind of the core and most importantly in the innovatorperspective class, which is the one that I lead. And so, the classes sort of [] incorporate some principles of design thinking, but we kind of never call it that. And there are a couple of reasons why I choose never to explicitly call it that that I'm happy to go into if you want. So, the answer is yes with a qualified yes, meaning we never explicitly say "this is design thinking and we're going to teach it in this way."	1.60%
Education	Design think ication	Academic Member 2	Sure, so I kind of feel about design thinking the same way I feel about innovation, so I often say to my students that if I could eradicate the word "innovation" I happily would, which is ironic given that I teach innovation. But I just think that the word has come to mean so many things that it has ended up meaning nothing. And I think that a similar thing has happened to design thinking, where people use terms so loosely and there is kind of so many things that are attributed to be design thinking that when you get into that language, instead of sort of allowing you to be precise it actually forces you to be imprecise because everybody has a different idea of what design thinking or innovation means. And a lot of the things that people think they mean are actually misconceptions. And so, I prefer not to use that language to avoid bringing up whatever connections people already have to the term, and again because I think it just has so many meanings in so many people's minds that it kind of precludes us from the precision that we need in order to teach the different kind of components or techniques or concepts of it that I want to convey.	2.50%
Education	Design think ication	Academic Member 2	And so, what I mean by automatic is that just by showing them the information they're not going to get it. And that's where the pedagogy of these things is radically different from the pedagogy of other things. When you teach DCF you show the concepts, and people understand the concept and they get it and they can do it, and that's all you need, right? It's just about sharing information and showing data and ensuring that people understand data. That's not true in this case. I think that they can rationally believe that they already do some of these things, but actually they can trick themselves into thinking that they understand something, again because of their starting point. And so that's kind of what I mean by "automatic." And that's what I mean by this requiring a different type of pedagogy. I don't know if I'm making sense. I am speaking in very abstract terms.	1.90%

Education	Design think ication	Academic Member 2	Core classes are one hour and 20 minutes long, and they meet twice a week, and they take it as they're taking other core classes that are giving them a set of assignments and a set of dissertations for the work that they do. And they also put them in teams but they work on very different types of tasks where the most common thing for our MBA students to do is to break up the tasks and sort of do a divide-and-conquer type of approach which is the opposite of what you need for these types of things. So, kind of almost in every dimension the type of rhythm and the type of time allocation that you would want to have for this kind of class is not particularly what aligns with the type of rhythm and the type of time allocations that all other core MBA classes would follow. But it's not an option not to fit within the core schedule because that's what the MBA program is designed to do. And so, you kind of have to get a way to make it fit.	2.30%

Category	Code	Case	Text	% Words
Elements	Elements of	Academic Member 3	The question is, how do you teach individual skill development, for example, interviewing and the use of design techniques, in teams? And I feel like finding the right balance between those two is really complicated because well, just in terms of time if nothing else, I mean, I thought about just teaching an entire course of this around individual skill development, like how do you observe and notice? How do you frame and reframe? How do you step back from a problem, frame and reframe it? How can you generate alternative ideas? Imagine and design yourself like generate ideas? And then how do you make an experiment? Can you build a prototype of something? Can you try something out on someone else? All those four are really individual skills that then have to be practiced in teams.	1.10%
Elements	Elements of	Academic Member 3	I think critical thinking is also important and – so here's what I think a lot about this sort of maybe it's just thinking and how do we actually equip students to basically go through those four capabilities in the learning cycle.	0.30%
Elements	Elements of	Academic Member 3	You know, we talk in design thinking about assumptions but they're also important parts of other – and to me, that quadrant of framing and reframing is at the heart of what we need to be teaching students to be able to do	0.30%
Elements	Elements of	Academic Member 3	The skills we teach on the 'how' side, they still need them. Diverge, converge come up with multiple different solutions. Don't just converge on the first one, that's important and, you know, I think that's a standardized testing problem that we just trained a lot of students to come to the one and only answer. So that's important, and then making and experimenting – this is probably the other thing that's hard for students; is to be willing to try something out before it's finished.	0.70%
Elements	Elements of	Academic Member 3	So they probably didn't come out of a consulting firm, they probably didn't come out of a hedge fund, because they came from someplace where reflection was a part of – was allowed and thus, they could practice it. Yeah.	0.30%
Elements	Elements of	Academic Member 3	I think some number of them have, yes. I think they – I think once you go out and talk to one or two people, you get over your fear doing that, you get over your fear of not having the right answer before you go talk to people, etcetera. So the ones who are willing to do that I think that has been valuable. The other thing that I think has been valuable for some number of them is diverge-converge.	0.60%
Elements	Elements of	Academic Member 3	Now, if the question is, 'what types of customers should we be asking?' Yeah, throw a bunch of post-its up there, cluster them and then figure out which ones you're going to go talk to, right? Like there's times when the diverge-converge using just straight post-it note stuff is the way to go. There are other times like when I'm trying to design the drive-thru for a fast food restaurant where it's like you need morphological analysis or the kinds of stuff that we used to teach in New Product Development. Here's all the ways so I can take an order. Here's all the ways I could hand the food out the window. Here's all the ways I could move the cars around. Like there are so many things going on. Then I have to mix and match them all. You know, that's kind of the 'great bowl of chili' thing. And frankly, we don't teach any of that stuff in design thinking. We just go, "Okay, you got your homework? We now come up with a bunch of ideas." If an idea has any complexity to it. That just doesn't actually work.	1.60%
Elements	Elements of	Academic Member 1	Absolutely. Yeah, the way that, you know, I personally actually talk about innovation. I think of innovation as being a function of both creativity and execution. And, you know, in order to have innovation, you have to have both, right? You have to be able to have, you know, the great ideas, but you also need to take it out of the market and be able to be successful with that, right. So, creativity and execution.	1.20%

Elements	Elements of	Academic Member 1	You know, I'll start with just framing, you know, the value of design thinking, how it differentiates from other processes that are out there in the industry, right? And, for me, especially for business school students, just framing it as the difference between problem-finding and problem-solving is really the first, you know, big aha moment, right? This is fundamentally an innovation process that, you know, that helps you create a methodological way of finding the right problems to solve, right? You know, that's usually something that you don't learn elsewhere and it also kind of explains very quickly how this is different from like Agile methodology or Six Sigma or kind of other, you know, processes that you might learn about in a business school or in operations management and things, right. So understanding that it's, design thinking is about problem-finding versus problem-solving. Finding the right problem to solve is the first step and then how you do that, you know, through kind of using, you know, this human-centered process and this notion, a point of view, I think is also something that's, you know, one of those aha moments where it's not necessarily just about, you know, a creative process with [] brainstorming sessions, but, you know, creating, framing the point of view for what you're trying to do, right, what's the problem that you're trying to solve, who is the person that you're trying to solve for, what is their context, and understanding some insights about the solution before you try to find the solution, understanding the insights about the problem before you can jump into the solution. I think, for me, those are the key insights that people take away and say, okay, that's what really distinguishes design thinking from everything else that I know.	5.10%
Elements	Elements of	Academic Member 5	"I could argue that all the elements of design thinking are important to learn, from field research to making to iterating."	2.20%

Category	Code	Case	Text	% Words
Elements	Elements of	Academic Member 5	"Invention and creativity is also difficult for them primarily because it's out of their comfort zone and it's very different from all the other management coursework they do. I do think creativity can be taught and there are techniques for doing so. However, you need to be open-minded to it."	5.50%
Elements	Elements of	Academic Member 4	Well I think all of them, really. They need help scoping problems because they tend to define problems too obviously and too narrowly. They need help being taught how to go out and do ethnographic interviews and use tools like jobs to be done and journey mapping. They need a lot of help figuring out how to take raw data and convert it into insights, and then they need more help about how to convert those insights into ideas and how to come up with ideas. They need help in terms of how to test their feasibility and attractiveness.	1.40%
Elements	Elements of	Academic Member 4	I think it's probably pretty closely related because what it does is take this insight about current reality that you have and translates it – the way – the same way a "how might we" question into some – in some ways, a job to be done of the solution.	0.70%
Elements	Elements of	Academic Member 4	Sometimes it's hard to get them from telling to showing and to be – and to actually push them towards human-centered stories. That's a little bit of a push, but generally, once the – once they're introduced to the idea of a low-quality prototype using something like a storyboard, they usually enjoy that part and they pick it up pretty quickly. I don't see a lot of struggling with that	1.00%
Elements	Elements of	Academic Member 4	The first step in hypothesis testing is surfacing assumptions and then capturing those assumptions in the form of prototypes so that you can go and usually do some kind of co-creation where you're walking users through a prototype and getting feedback. That's as far as we get in class and the real methodology – eventually, you would progress to in-market experiments in which you're trying to test critical assumptions by – instead of asking people whether they'd by a product or benefit from a service, you actually put it out there and see what reaction you get.	1.40%
Elements	Elements of	Academic Member 2	So, get them to understand the role uncertainty plays in having, let's call it innovation, I hate it but just as shortcut for now, let's call it innovation. So, what's different about innovation is that there's so much uncertainty surrounding every component of the process that you have [] so once you have that [] around, how much uncertainty you're working with, then number one, it's about developing insights about the people who you're trying to influence or help, and number two, following the various [] approach. Everything else that you do and that I think is also kind of important [] or flows from this. So, understanding real options methods for evaluating experimentation and failure and the financial case for experimentation for example is very useful []. But you only understand it once you understand that you have to follow a more [] approach. There's the question of what kinds of teams you need to create that incorporate--	1.90%

Elements	Elements of	Academic Member 2	Right, so understanding that the type of team configuration including the type of diversity and the type of structure that you need to create for a team in order to be able to do this well of course, is important. And that's one of the things that MBA students can do very well to graduate. But that also flows from understanding the importance of integration and experimentation and the role of uncertainty. There is the question of how to sort of drive an innovation process within an organization that is going to be normally wired against it. And so, understanding the nature of organizations and how and why they might be sort of pre-dispositioned against innovation and—is a sort of, that's a very useful thing to learn but that only becomes relevant when you understand that this requires a different type of approach []. And so, I think those core initial things about understanding how much uncertainty there is and therefore how humble you need to be and therefore how human centered, how experimental you have to be to develop this are kind of the two core concepts and everything else kind of flows from that.	2.30%
Empathy	Empathy for	Academic Member 3	I know in design thinking we kind of translate that into customer empathy but if you look at the organizational literature, equally important to have empathy for employees or others. So there's emotional empathy, there's cognitive empathy, if you look at Goleman's work.	0.40%
Empathy	Empathy for	Academic Member 3	but it's not an emotional connection, it's not a story that I go, "Oh. Oh, I get it."	0.20%
Empathy	Empathy for	Academic Member 3	We're trying to drag them down to talk to other human beings and have empathy for them. And that's huge because we're asking them to do something that's like as far away as possible from what they are comfortable doing.	0.30%
Empathy	Empathy for	Academic Member 3	Anyway, so I think empathy is huge. I think that's a huge difficulty for them. I think it's hard for them not to converge too fast. And I think part of that comes from flying through that insights quadrant where they're not really stepping back and saying, "What assumptions am I making? And could I break them?" And that's an industry orthodoxy, this thing, like how do you get people to say, "What if that assumption didn't hold? What might I be able to do?" I think they have a lot of trouble with that piece of it like actually seeing things.	0.80%
Empathy	Empathy for	Academic Member 3	Outer is empathy, cognitive and emotional. And I mean 'other' is empathy. And 'outer' is systems understanding. And so that's kind of how I think about what we're trying to develop.	0.30%
Empathy	Empathy for	Academic Member 1	But, you know, you want that visceral experience of really, really understanding, you know, from the experience perspective what this is all about	0.40%
Empathy	Empathy for	Academic Member 5	They need to be creating lots of ideas which are better informed through empathy…it goes back to digging deeper and truly understanding people."	2.50%
Category	**Code**	**Case**	**Text**	**% Words**
Empathy	Empathy for	Academic Member 4	They had to interview teachers, classroom teachers about how to better engage them in school innovation efforts. They interviewed prisoners returning – I mean, recently released prisoners who were trying to get – reenter the workforce. So I think in each of those cases, these aren't necessarily people that they spent a lot of time with talking about their needs before and so I think just the basics of doing the research even without the developmental insights piece – just doing the research builds empathy.	1.20%
Empathy	Empathy for	Academic Member 4	So I think where the user needs piece comes in is at one level, it should produce a better set of ideas since you can drive ideation off of data on user needs rather than the traditional driving it off of what you think people need and then I think in the process, having done the research also – in my researches I've seen, it built a certain motivation to change because as people develop empathy, they come to care whether or not the ideas they generate actually help people. So I think on numerous fronts, it changes the rest of the process when you do the research and develop some empathy.	1.60%
Field Research	Going into th	Academic Member 3	then half time spent visiting innovation centers in local firms as well as design firms so they get a sense of the industry as well as the approach	0.20%
Field Research	Going into th	Academic Member 3	So for example, I might be teaching them, you know, interviewing and observation, so their homework assignment would be to go out and conduct an interview or observe people, for example, on fruit consumption. And then when they come to class, they will debrief that interview data with a team.	0.40%
Field Research	Going into th	Academic Member 3	And so, they went in pairs off to tea shops all over San Francisco and they began to really understand why people went to these places, you know. They didn't zero in on the kind of tea or the teacup or whatever, they really got that there was a context, a social emotional context. But they sat beside other teams in the class who didn't get it.	0.50%
Field Research	Going into th	Academic Member 1	we've actually tried to take students and put them into real-world situations, you know, actually even outside of the classroom	0.40%
Field Research	Going into th	Academic Member 5	"The moment of deep understanding can only be discovered in the context of actually going out in the field and learning about people in a more meaningful way. The field work is then brought back into a studio setting for further reflection and development work."	4.70%
Field Research	Going into th	Academic Member 4	Well, I think they learn it best when they have to apply it in the real world.	0.20%

Field Research	Going into th	Academic Member 2	Another one is to have them predict what—I ask them to predict what the needs of a particular—yeah, they have to try to come up with a problem they want to solve and come up with a first hypothesis as the solution, and then I ask them to kind of unpack what assumptions or what hypotheses their solution reflects about the humans whose problem they're trying to solve. So, I try to sort of have them write down their intuition about the people who supposedly they're going to be working with. And then they have to actually go out and interview a couple of people and develop a user archetype that is truly developed based on that human. And they kind of agree they have to realize—they feel—when they do the first exercise they actually feel even better about their intuitions, they're like, "yeah, this is smart. I'm clever. Look at how clever my intuitions are." But then they go out and they talk to real people and they realize that their intuitions were terrible and they were in many cases kind of—in the best cases orthogonal and in the worst cases contradictory to what the humans actually cared about, and so they realize that their intuitions were wrong, completely wrong, and that they really had to go out and talk to someone with the [] curiosity to really learn what they needed. And so, this is another example of an exercise that shows them that their intuition can't be trusted for a certain type of problem and that they need a different set of tools.	3.20%
Importance	Importance o siness schoo	Academic Member 3	Yeah. I mean in short, I think the answer is yes. I think it depends a little bit on what you include in design thinking	0.20%
Importance	Importance o siness schoo	Academic Member 1	Yeah. I mean, my simple answer to this is absolutely, especially from the industry's perspective. You know, what we see and then, again, in my day job I work at SAP and SAP is one of these large software companies where almost all the, you know, businesses from around the world run on []. So I think, the crazy number is like 75-over 75% of all transactions in the world go through SAP systems. The only reason I did that is because we're present in pretty much every industry around the world and what we hear, you know, the number one priority for our customers is being able to innovate in a market where things are very, very competitive and things are changing very rapidly. And if you don't have an innovation culture within your organization to promote innovation, then you're going to be leapfrogged by the competition and you won't, will not be relevant very soon, right. So that's the constant message that our customers are telling us and, you know, they expect, you know, our software, because we're a software company, to help with, especially from a technology perspective, help with those innovations that ultimately, I think, innovative thinking, innovative culture, and driving innovation and transforming innovation in a large-scale organization, these are all things that I think those core [] are trying to do is trying to go through the []. So, you know, you could learn, you could go to a business school and you could learn about strategy, you could learn about finance and those types of things, but, you know, one of the most critical skills businesses are looking for right now is, you know, the ability to drive innovation and be creative.	4.80%
Importance	Importance o siness schoo	Academic Member 5	It's those students, who have the capacity to integrate, that can make a real difference in the world and I think that's really important	2.70%
Category	**Code**	**Case**	**Text**	**% Words**
Importance	Importance o siness schoo	Academic Member 4	I was going to say I'm not exactly a disinterested observer since I spent most of the last eight years working on how to teach design thinking in the business school context. Then it's pretty clear that I consider it – well, I consider it extremely useful. I'm not sure that I would want to go toe to toe with anyone that said it was any more important than a class in accounting or a class in finance or in marketing or whatever, but I do think it brings a different set of tools to the business school environment that are extremely helpful in today's environment.	1.50%
Importance	Importance o siness schoo	Academic Member 4	I would say that it – design thinking is more limited. Certainly, human – if they were talking about human-centered design, it is not as broadly applicable. I mean, in a business, you need to know accounting no matter what kind of business you're in or what kind of circumstances you're facing. You need to know finance and some marketing and things like that, whereas I think design thinking is usable in a particular set of circumstances, not necessarily all, but there's a set of circumstances that are increasingly important where we don't have a lot of tools, and so I think that's why it is getting the attention it's getting. I mean certainly, it's easy to use human-centered design in areas where it doesn't make sense, where existing tools are, if anything, superior, but there is that set of problems which designers call the "wicked problems", but they're problems characterized by a lack of structure and a lack of good data from the past, and where you've got those problems, I think, design thinking clearly brings something to the curriculum that we don't have right now.	2.80%

Importance	Importance (usiness schoo	Academic Member 2	Again, it's yes and I think that—so the short answer, or the answer along the lines of how you're asking the questions is I absolutely believe so, for a number of reasons. If we think of design thinking as kind of a set of principles, and especially a set of kind of an approach to problem solving that is more about synthesis based on understanding and observation of human needs and then a process of discovery driven by integration and experimentation that acknowledges how much uncertainty there is in that process of discovery and that therefore requires different types of methods than just raw analysis and a process of synthesizing sort of those insights and discoveries into kind of a solution that seeks to solve a particular set of problems. So, we think about design thinking as a kind of set of principles and methods to help with this kind of more discovery-driven type of problem solving and I absolutely believe that's a critical thing to teach MBA students for a number of reasons, starting with, it's one of their weaknesses, I think. They—I think MBA students tend to have backgrounds that have given them really good tools for analysis and for kind of data-driven decision making and for sort of figuring things out through just thinking really hard about things. And some of the problems that we're increasingly facing don't fit well into that paradigm. And so, I think they really do need to understand that there are other ways of solving problems and there are certain problems that we're facing today that actually are better solved through these other methods and that the traditional methods that they have used are actually not very well suited for some of the problems that they're going to be facing.	3.60%
Learning	Learning des	Academic Member 3	For the evening/weekend students, we've gone through a number of iterations but it's now a really sort of a three-unit class that combines a little bit of Problem Finding, Problem Solving, a little bit of a project and then a like a weekend retreat where they apply the approaches to various kinds of problems	0.40%
Learning	Learning des	Academic Member 3	And they would come up with insights. So I'm teaching them sort of, well – I mean, this is a lot of the stuff that I think a lot about. The question is, how do you teach individual skill development, for example, interviewing and the use of design techniques, in teams? And I feel like finding the right balance between those two is really complicated because well, just in terms of time if nothing else, I mean, I thought about just teaching an entire course of this around individual skill development, like how do you observe and notice? How do you frame and reframe? How do you step back from a problem, frame and reframe it? How can you generate alternative ideas? Imagine and design yourself like generate ideas? And then how do you make an experiment? Can you build a prototype of something? Can you try something out on someone else? All those four are really individual skills that then have to be practiced in teams. So some of what I try to do is figure out how do you strike a balance between having individual students, particularly around interviewing because they're kind of not very good at it. So how do you – how did you help them go out and practice interviewing and give them feedback on their individual interviewing skill. At the same time, you know, you're trying to have them learn what it's like to collectively debrief a set of interviews and learn something from it.	1.90%
Learning	Learning des	Academic Member 3	Like a friend of mine at the d.school and I have this discussion often because our sense is that the d.school brings people in for a bootcamp and they have fun for the week and they leave with something and they tell them it's really good but it's not clear that very many of them are getting to insight. And I think if we keep teaching design as if it's just this cute little process when it's hard work to actually get the insights, we're doing a disservice	0.70%

Category	Code	Case	Text	% Words
Learning	Learning des	Academic Member 1	But it's actually learning through practice and I think it's such a radical, radically different approach, especially for people that have, you know, are familiar with the traditional way business courses are taught, putting people in real, you know, the things that we try to do in our classes, we've actually tried to take students and put them into real-world situations, you know, actually even outside of the classroom. Can you actually have your learning be done outside the classroom and in the environment in which you need to practice it, right? So we typically have industry partners in their office and we will have some meetings in the classroom, but we try to do a lot of the meetings and the exercises, you know, directly with the corporate partners and in the context in which the corporate partners are working in their work environment. And I think, you know, experiential learning is definitely kind of a, I think, not just for business schools but in general, I mean, that's the best way you learn, I think.	3.00%

Learning	Learning des	Academic Member 1	But a lot of design thinking isn't, you know, just the decision that has to be made, but it's how do you actually practice it, right? How do you actually take an organization that's been doing things in a certain way and not just make a decision that we're going to do things in a different way, but, again, what the actual practice of changing a mindset or introducing new processes and feeling, you know, what are the barriers that may come up as you're trying to implement, you know, that new thing	1.60%
Learning	Learning des	Academic Member 4	They're practicing the entire design thinking concept. So they're going from scoping the problem right through design criteria, ideation and then into testing.	0.30%
Learning	Learning des	Academic Member 4	Yeah. I mean, I don't think it's business school students. I think everybody does it. Your first pass at insight tends to be superficial. I mean maybe if you work for a design firm and you're very good at it, your first pass is deep, but when you take people who haven't been trained in it, their first pass is going to be superficial, for the most part, and helping them to see how to push beyond the superficial level into deeper insights is really critical if you want the quality of the ideas they produce to actually improve.	1.40%
Problem Finding	Solving the r	Academic Member 3	That's also important, that I'm asking good questions. So the frame and reframe, like how do I take all that messy data, that again is, you know, there's critical thinking tools there as well.	0.30%
Problem Finding	Solving the r	Academic Member 1	But you need to have the creativity side, which is sometimes about, not about problem-solving, but finding the right problem to solve in the first place, right? It's about problem-finding and that's one of the major, you know, value propositions of what design thinking is all about	0.80%
Problem Finding	Solving the r	Academic Member 1	You know, ultimately, it's about finding the right problem and what design thinking is very good at is, in the approach of finding the right problem to solve, it puts really the emphasis ultimately on, you know, what is the end user or consumer or customer experience	0.80%
Problem Finding	Solving the r	Academic Member 1	Finding the right problem to solve is the first step and then how you do that, you know, through kind of using, you know, this human-centered process and this notion, a point of view, I think is also something that's, you know, one of those aha moments where it's not necessarily just about, you know, a creative process with [] brainstorming sessions, but, you know, creating, framing the point of view for what you're trying to do, right, what's the problem that you're trying to solve, who is the person that you're trying to solve for, what is their context, and understanding some insights about the solution before you try to find the solution, understanding the insights about the problem before you can jump into the solution.	2.20%
Problem Finding	Solving the r	Academic Member 1	Framing the problem in the first place. Because so many things, you know, we're exploring the solution stage and there's aspects of design thinking that [], but fundamentally kind of differentiating how [] is, you know, all the work that you do before getting to the solution stage. So, identifying the problem where you want to actually explore the solution space is really the key differentiating characteristic of design thinking.	1.10%
Problem Finding	Solving the r	Academic Member 1	And I would argue, it's, no, you know, there's some of that, but, you know, the more important thing is, you know, creative ways of finding the right problem to solve in the first place,	0.60%
Problem Finding	Solving the r	Academic Member 5	"the ability to find a problem that is important and means something to people and the ability to generate a hypothesis from which you generate lots of ideas."	2.90%
Problem Finding	Solving the r	Academic Member 5	"There needs to be a greater focus on depth and problem-finding within design thinking education. What is the real problem? And what are we trying to solve? If we can answer those questions, we can get closer to developing more meaningful ideas.	4.50%
Project Based	Project base	Academic Member 3	a little bit of a project and then a like a weekend retreat where they apply the approaches to various kinds of problems	0.20%
Project Based	Project base	Academic Member 3	And then I have about a third of them who take a follow-on Advanced Innovation course where they work on their own projects based on the stuff that they learned in the immersion week	0.30%
Project Based	Project base	Academic Member 3	and it's spread out over a longer period of time then we might have them work on a project that has some continuity which allows them to get a little bit more in-depth in using some of the tools and techniques	0.30%
Project Based	Project base	Academic Member 3	The projects that have gotten to meaning that mostly come to my mind were projects where students actually wanted to start a company before they even came in to the class.	0.20%
Project Based	Project base	Academic Member 1	So we typically have industry partners in their office and we will have some meetings in the classroom, but we try to do a lot of the meetings and the exercises, you know, directly with the corporate partners and in the context in which the corporate partners are working in their work environment.	0.90%

Category	**Code**	**Case**	**Text**	**% Words**
Project Based	Project base	Academic Member 1	I think bringing it out of the classroom and bringing it into contact with as many real organizations as possible. You know, having a variety of different types of organizations, showing organizations that they have either worked for or potentially want to work for where, you know, they've had success, you know, success stories in environments that the students can relate to. But I think those are really important, right.	1.20%
Project Based	Project base	Academic Member 5	"Again, it goes back to the notion of going deeper. Thinking deeper and understanding at a deeper level. This cannot be simulated and needs to be practiced and nurtured through project based application."	3.40%

Project Based	Project base	Academic Member 5	"Learning design thinking occurs best through the project based application of the process, skills and deep thinking that is needed to solve complex problems	2.50%
Project Based	Project base	Academic Member 4	So a lot of Darden is taught through the case method and I use a little bit of case method in the design thinking class to introduce them to the different tools and aspects of the process, but most of the learning happens when they actually have to go out and apply it in a real-life project. So any design thinking that we teach at Darden is taught using live projects as part of it.	1.10%
Project Based	Project base	Academic Member 4	We used the projects throughout the class in both classes and then we used the case to give them a chance to practice in the classroom whatever element of the project that they're dealing with. So in the beginning when they're scoping the project and laying out the boundaries, we have a case that they use, and they practice scoping on the case, and we talk about it in class, and then they go out and they try and scope their project. When we get to insights, we have a case where we look at a lot of raw data and we try and develop insights, and then after that, they go and they try it – the same thing on their project. So pretty much in every step of the way, we have some case materials that introduce them quickly to a tool or a part of a process. They practice it in class or in homework, and then they go out and they try and do it.	2.40%
Project Based	Project base	Academic Member 4	It depends upon the class. In the second-year elective where we have a whole semester, the students have outside clients. So I merely line up however many clients as I need for that class and then introduce the student teams to them, and then they're off and running, and I'm really not involved again until towards the end where the clients are evaluating the quality of their work, or I'm not involved with the clients and have the students establish their relationship. With the first year course – last year, we tried it with people we called "sponsors" who were like kind of quasi-clients. You weren't solving their problems just for them; you were trying to solve a generic problem that they had, but we found that that was really awfully complex for seven weeks because sometimes the companies gave the students mixed messages from the faculty. So this year when we did it, we just selected an issue and then we assembled a team of kind of subject matter experts to help those students get started on that issue, and then they report it out at the end to those subject matter experts and faculty rather than really considering the clients.	2.90%
Project Based	Project base	Academic Member 2	To me that's insight, and that's the type of insight that I try to get my students to experience. And the only way they can experience it is through experience, through actually doing something, actually struggling through something and then trying a different set of tools that allows them to arrive at a solution that they now know they wouldn't have otherwise been able to achieve. And so--	0.80%
Project Based	Project base	Academic Member 2	At the same time, in parallel, the students have a class-long project where they are practicing the different things that we're learning on their project. So, they start with a problem and then they kind of get into teams based on that problem and then they're working on that problem for the length of the class. And so, as they're learning different tools, the assignments force them—force this strong word—it's not just struggle—we force them to try out these tools in the context of the problem that they already cared about. And so, we have an outside guest come in for a session and they've been working on that for a couple of days. Then we teach the tool and then they use that tool for their own class-long product.	1.60%
Quantitative and Qualitative	Quantitative proach	Academic Member 3	I know in design thinking we kind of translate that into customer empathy but if you look at the organizational literature, equally important to have empathy for employees or others. So there's emotional empathy, there's cognitive empathy, if you look at Goleman's work. So there's observe and notice which is critical whether you want to say that's only a design thinking thing, right, like it could be that I'm looking a lot of big data in observe and notice and I'm trying to find patterns in that data. That's also important, that I'm asking good questions. So the frame and reframe, like how do I take all that messy data, that again is, you know, there's critical thinking tools there as well. What's a stock? What's an inference? What's assumption?	1.10%
Quantitative and Qualitative	Quantitative proach	Academic Member 1	When you look at survey results, I think that that, you know, usually that's pretty cold. If the numbers [] based on aggregates and numbers, a lot of the insights that come out of, you know, user research, you know, through [] is really kind of understanding how people are feeling and, you know, what excites people and what really frustrates people. And I think, you know, when people see the value of kind of understanding, you know, the emotional response or the emotional feeling, and then how that leads to insights that drive business value, I think that's, for me, that's what I've seen in terms of, too, kind of understanding the difference between, you know, the types of survey results versus, you know, the human-centered result.	2.10%
Quantitative and Qualitative	Quantitative proach	Academic Member 5	"it goes right to the matter of quantitative and qualitative. Business students default back to what they know and what they feel comfortable with. They're often caught up proving something to be right through data — rather than discovering."	4.00%
Category	**Code**	**Case**	**Text**	**% Words**
Quantitative and Qualitative	Quantitative proach	Academic Member 4	Well, it's almost always quantitative data. In fact, they don't even call it "data" if your sample size is small, right and design thinking is producing qualitative data. So design thinking is focused on small samples of people that you go very deep with whereas the students in traditional market research are used to large samples of people that you go fairly shallow with. So in my view, it's all data; it's just different kinds of data and because of that, it's good for different kinds of things.	1.30%

Quantitative and Qualitative	Quantitative proach	Academic Member 4	Sure. I mean I think that in any good project, you're foolish if you ignore data that's available of relevance of any kind. So we see students consulting quantitative on things like larger trends and things like that at the beginning of projects, and then when we move into the testing module, the first question you ask yourself, "Is this – there data out there already that will help me test this hypothesis?" because we certainly don't want to go get the data if it already exists. So I think there's different points in the process where qualitative and quantitative data can work very well together.	1.50%
Studio	Studio cultur	Academic Member 3	Well, we're lucky because about seven years ago around the same time we started teaching this, well no, five years ago, we had a couple of years of scrambling to find dorm room lounges we could teach those classes. It has to be flat with tables and chairs that move. And ideally, it has wall space for each team to work on in whatever form that takes. We were lucky that we got money to build our innovation lab, which is an open classroom with cubbies that have floor to ceiling whiteboards. So I mean you know all that stuff. So we have that kind of a space which is way, way, way better than our stage on the stage classrooms. And the first year I taught this class, we taught it in the only flat room we had which is sort of an auditorium, is you will that we use for speakers. But it's a flat – and I bought a roll of butcher paper for each team. So I had fifty rolls of butcher paper in my office. And I would roll the rolls of butcher paper over to the room for every class. And the teams would get them out and unroll them. And that would give them their little bit of their continuous visualization, if you will, of their project. I have to say I kind of miss that. I don't miss rolling the rolls of butcher paper.	1.90%
Studio	Studio cultur	Academic Member 3	Well, see that was the first year I did it. And actually to say at some extent, they were the best involved that you're a lot of years in this class. But they trust me and anyway. It made it more physical because they were kind of sitting around their butcher paper, as opposed to sitting around a table and just talking at each other.	0.50%
Studio	Studio cultur	Academic Member 5	"The notion of critique is incredibly valuable. Putting ideas up on a wall and getting direct feedback is an important part of design thinking…but business students often shy away from critique…they don't like to be wrong. But critique is central to design and we can all learn through critique."	5.40%
Studio	Studio cultur	Academic Member 5	"Studio context. That's it plain and simple. Design Thinking needs a space that is not perfect or polished. You need to have a space that's messy and that allows for work to be done and ideas to be shared."	4.20%
Studio	Studio cultur	Academic Member 5	"It's important that the studio is a place where the faculty can coach and mentor students in an environment that allows for both conversation and critique. Feedback is important and the studio setting seems to allow it in a way that a regular classroom cannot….it somehow feels less threatening and more collaborative."	5.60%
Studio	Studio cultur	Academic Member 5	A studio space and culture enables them to learn from each other and feel a little less intimidated because often they are at the same level of design understanding…which generally is not very deep	3.60%
Studio	Studio cultur	Academic Member 4	Well in terms of the ideal physical environment, that's pretty easy. I mean basically, you want a flat classroom. A lot of our classrooms are tiered and we do some teaching of the case portions of design thinking in the tiered classrooms, but they're really very difficult to do collaborative group work in, and so we've been in the process of creating flat spaces. We have a very nice innovation lab that we had for about seven years now, I guess, but it's not big enough to teach the whole – to take all Darden first years. So my second-year elective, I get to teach in the innovation lab. It's basically a flat space with movable roundtables and chairs and lots and lots of wall space, and – that allows students to work closely together with their teams and yet also be able to talk to each other across teams and to be able to listen to presentations that I give them as we move along in the steps and things like that. So physically, I don't think design thinking takes a lot of fancy stuff; it's just stuff that many business schools don't have, namely flat space.	2.90%
Studio	Studio cultur	Academic Member 2	And so, assuming that it's a core class then I think that small teams are important. I would definitely like to do this and have a flat classroom, have a table-based environment where it's very easy for them to share both physically created things but also digitally created things. For example, there's a classroom that's my favorite [] at Yale University that's called the TEAL classroom, it's the Technology Enhanced Advanced Learning classroom, and it's kind of a perfect setup for this. It's small tables, there are I think 20 screens all around the room, and everybody can connect to any screen at any point in time very easily. And not only are there screens all around the room but there are also white boards and cork boards all around the room. And so, people—it's designed for people to work on stuff in parallel and then quickly and rapidly share stuff with everybody else. So, to me that would be the perfect teaching environment	2.00%

Category	**Code**	**Case**	**Text**	**% Words**

Value	Value of des	Academic Member 3	they're not patient. I've been – a new approach I've been using is to have them read stuff about this and then have a discussion with one another about whether they've used it at work or, you know, how they could imagine using it, this kind of stuff just to kind of see. And so many of them will say, "Oh, it just takes too long." So the idea, it's just like design for manufacturability where, you know, you have to invest longer in the design process but then the manufacturing ramp is shorter. If you spend long enough like [], if you spend three months getting the personal stage monitor story, the investment you make in changing your brand, changing your go-to market, developing the technology pays off big time because you figured out something that really matters but the students want the answer today and they come from companies that have rewarded them for that.	1.20%
Value	Value of des	Academic Member 3	Here's how I try to frame it. Recently, more than ever, there's so much stuff out there now about digital transformation. I don't think there's a single industry that is not going to be radically transformed in the next ten years. And these students have to be part of that. And they're not prepared to be part of it if they can't adopt the mindset that we try to teach them in design thinking.	0.60%
Value	Value of des	Academic Member 1	And I think that's something that design thinking clearly gives in terms of its methodology and output. And, you know, I think that's why it's a great way to help organizations, you know, even out that innovation equation, you know, the creativity times execution. It's the design thinking that helps, you know, bring organizations into, helps organizations scale that organizational creativity	1.10%
Value	Value of des	Academic Member 1	It means customer experience, you know, creating [] customer experience and transforming that customer experience. And then it's, you know, driving an innovation culture within the organization to be able to deliver something that you haven't been able to deliver before. And, again, you know, both the customer experience and innovation culture, you know, that's really, I think, a huge overlap to the value that design thinking brings	1.10%
Value	Value of des	Academic Member 1	the value of design thinking, how it differentiates from other processes that are out there in the industry, right? And, for me, especially for business school students, just framing it as the difference between problem-finding and problem-solving is really the first, you know, big aha moment, right? This is fundamentally an innovation process that, you know, that helps you create a methodological way of finding the right problems to solve, right? You know, that's usually something that you don't learn elsewhere	1.40%
Value	Value of des	Academic Member 1	I think, I think being able to, I think, I think most people come out of business schools with a certain set of knowledge, right? And you've got knowledge about kind of how businesses run, hopefully you have a strategic mindset, but, you know, again, being able to balance your strategic mindset with, you're not only kind of confident in your own creativity, but being able to feel confident in your ability to take your individual creativity and scale that creativity across your entire organization and build a creative culture within your organization. I think, I think that's, you know, I think that's the basic value of design thinking, right	1.90%
Value	Value of des	Academic Member 5	"Design thinking is a way to connect elements of business such as strategy and marketing. It's also a way to connect teams and people to real problems that matter."	3.10%
Value	Value of des	Academic Member 5	"It is this idea of deep thinking, or deep understanding that is fundamentally lacking in business schools."	1.80%
Value	Value of des	Academic Member 5	"As design shifts away from artifacts and to services and experiences, design thinking becomes more and more valuable. Not just to designers, but perhaps equally importantly to design thinking business leaders"	3.20%
Value	Value of des	Academic Member 5	You can't realize the value of design thinking without working harder and going deeper	1.60%
Value	Value of des	Academic Member 4	I mean certainly, it's easy to use human-centered design in areas where it doesn't make sense, where existing tools are, if anything, superior, but there is that set of problems which designers call the "wicked problems", but they're problems characterized by a lack of structure and a lack of good data from the past, and where you've got those problems, I think, design thinking clearly brings something to the curriculum that we don't have right now.	1.10%
Value	Value of des	Academic Member 4	Well, I think it's generally both a new toolkit and a new philosophy for most of them. So we don't teach people to be human-centered anywhere else in the school curriculum, which is the first thing design thinking does and secondly, we teach people to analyze things using existing data as opposed design and conduct experiments, which is by and large what they do. So I think those – the frontend of design thinking with its emphasis on human-centered ethnographic methods and the backend of design thinking with its emphasis on the design of prototypes and their use in small, quick experiments. I think those just don't really exist robustly, elsewhere in this – in the curriculum of business schools, for the most part.	1.80%
Value	Value of des	Academic Member 4	Yeah. I think it replaces it in certain decision contexts. So I don't think they're necessarily used together all of the time. They can be in particular circumstances, but I mean, I think it's an addition to the toolkit. In some ways, it's not philosophically complimentary; it's quite different in how it views the people you are designing for and how – in what sequence you consider the needs of the organization versus the needs of the person you're designing for. So in some ways philosophically, I think it challenges the toolkit that we're teaching in the rest of business school, but I mean the more – the broader, more diverse a toolkit, the better. The question is, "Can they figure out which tools they should use when?"	1.80%

Category	Code	Case	Text	% Words
Value	Value of des	Academic Member 2	If I can summarize it in one word, it's humility. Q: Okay. A: And so this humility hopefully is translated into—one is understanding the importance of greed, being open to devoting the time to empathizing with and connecting with the people's problems they're trying to solve. So that's one version of humility. The second version of humility is understanding that the natural tendency of the organization is not going to go—it's not going to lead it to be more open and experimental but actually need to kind of double down what's done successful in the past and that in order to develop the sort of radically different types of traditions they have to follow a very different type of approach that kind of is at least orthogonal to what the organization would normally and traditionally try to do on its own.And that includes a much more experimental and integrative approach, therefore a different type of resource allocation [] that kind of thing. And the third is for them to realize that there are people who professionals at this and that there is a role for designers in business, not as—MBA students tend to believe that they only need to hire designers when they need to design the identity or the graphic component of their logo at the end of a process, and hopefully one of the things that they learned through this is that actually bringing in a designer from the very beginning—so bringing in designers as part of your strategy definition and your problem definition—not even your strategy—your problem definition from that moment forward and working intensely with them, hopefully that's another thing that they learned.	3.40%

Appendix S

Literature Review Mapping to Opportunities and Themes

	Literature Review Subjects identified and Conclusions Designerly Ways: What Designers Do	Opportunity	Theme	Theme Specifics	Literature Author
1	**Design**				
2	Design has moved past the notion of simply the creation of beautiful objects.	YES	Theme 7	A design thinking approach enables business students to address complex needs through collaborative hands on creative skills, that when balanced with a business approach can become a marketplace and leadership differentiator. The combination of both a business approach and a design thinking approach enables them to see and lead more holistically.	Dorst (2015), Schön (1983), Buchanan (1992), Cross (2006), Lawson (2006)
3	Design has been described in many different ways, including; a solution led activity that seeks to understand and solve problems through a reflective practice.				
4	Design is inherently creative.	YES	Theme 1	A critical skill that the business world is looking for is the ability to drive innovation and to be creative, and in order to be innovative, execution and creative skills are fundamental. Most business students coming into business school have little to no experience with creativity and design thinking.	Tovey (2016), Lawson and Dorst (2009)
5	Design is oriented to what is possible.				
6	Design is a human activity.	YES	Theme 1	Empathy, which business students are very uncomfortable, is fundamental to design thinking and can help connect people and organizations to problems that matter.	Brown (2008)
7	Design is iterative and non-linear				
8					
9	**The Role of Creativity in Design**				
10	Design and creativity are directly connected, as creativity fuels imagination, which in critical when developing something new.	YES	Theme 1	A critical skill that the business world is looking for is the ability to drive innovation and to be creative, and in order to be innovative, execution and creative skills are fundamental. Most business students coming into business school have little to no experience with creativity and design thinking.	Kelly and Kelly (2013)
11	Creative individuals often seek new ways of thinking.	YES	Theme 8	Business students generally don't have a creative background and often the tactical skills associated with	Sternberg (1991)

				design thinking don't come naturally and can be difficult to learn.	
12	Creativity is a choice that people make based on attitudes toward life.				
13	Creativity is not always expected in business.	YES	Theme 7	Business students who have a design thinking skillset, see it as a competitive advantage over business students who do not have the skillset.	Brown (2008)
14	Creative thinkers are underrepresented in business.	YES	Theme 7	A design thinking approach enables business students to address complex needs through collaborative hands on creative skills, that when balanced with a business approach can become a marketplace and leadership differentiator. and lead more holistically.	Nussbaum (2013)
15	Creativity can be taught.	YES	Theme 4	Business students are able to learn the tactical elements of design thinking through an immersive hands-on experience.	Kelly and Kelly 2013, Sternberg and O'Hara (2000)
16	**Design in Innovation**				
17	Design can be seen as a catalyst for innovation.	YES	Theme 1	A critical skill that the business world is looking for is the ability to drive innovation and to be creative, and in order to be innovative, execution and creative skills are fundamental. Most business students coming into business school have little to no experience with creativity and design thinking.	Ruggles (2002), Rusk (2003), Walton (1995)
18	Design and innovation are often seen as connected processes that look to develop and drive value.				
19	Design gives form to decision making in the innovation process.	YES	Theme 1	Design thinking is an approach that supports business students in navigating uncertainty and ill-defined problems.	Hansen and Andreasen (2006)
20	Conceptualization may be seen as the core activity of innovation.	YES	Theme 4	Business students are able to learn the tactical elements of design thinking through an immersive hands-on experience.	Alben (2002)
21	Innovation is often associated with change and design is seen as an essential vehicle for conveying new ideas and perceptions that drive innovation.				
22					
23	**Design Thinking**				
24	Design thinking has been described in many different ways, including; a cognitive process related to processing and decision making, an act of imagination and creativity, a user	YES	Theme 1	Design thinking is an approach that supports business students in navigating uncertainty and ill-defined problems.	Junginger and Faust (2016)

	centered problem-solving approach.				
25	Design Thinking is human centric as is based on a deep understanding of people that is informed through empathy.	YES	Theme 4	Business students who use design thinking will be able to understand people more deeply through qualitative ethnographic field work, which will help inform and frame meaningful opportunities or problems that people actually care about.	Efeoglu, Møller, Sérié, and Boer (2013), Lockwood (2010)
26	Design thinking is not limited to the domain of design, and can be utilized by individuals who have shared values and a creative passion.	YES	Theme 3	Design thinking is action oriented and is best taught and learned through a lived experience that is project based, which may prove to be uncomfortable to some business students.	Buchannan (2016)
27	Design thinking requires a balanced approach of problem-focus (analytical) and solution focused (creative).	YES	Theme 2	The qualitative discovery approach associated with design thinking is complementary to the quantitative execution approach often found in business curriculums. The combination of both proved to be valuable to business students based on their classroom experiences.	Tovey (2016), Gardner (1983), Schön (1991)
28	Design thinking enables people to see and act differently, but can also be seen as a novelty, in the minds of efficiency lead individuals and organizations.	YES	Theme 2	Design thinking needs to be coupled with business thinking in order to see value from the student's perspective and to realize value from the business organization perspective.	Dorst (2015)
29	Design thinking is action oriented and collaborative.	YES	Theme 3	Design thinking is not simply an intellectual exercise, and as such, it must be taught in a fundamentally different way than business school content is delivered to and absorbed by students.	Brown (2008)
30					
31	**The Role of Empathy in Design Thinking**				
32	Empathy helps to frame new knowledge from people, which is fundamental to solving problems in the service of innovation.	YES	Theme 1	Empathy, which business students are very uncomfortable, is fundamental to design thinking and can help connect people and organizations to problems that matter.	Pine and Gilmore (1999), Szasz (2016),
33	Empathy is a quality of the design thinking process.				Kouprie and Sleeswijk Vissor (2009)
34	The four phases of empathy in the design thinking process include; discovery, immersion, connection and detachment. All of which are deeply personal.				Kouprie and Sleeswijk Vissor (2009)
35	Empathy is fully realized in the design thinking process through the combination of affective				Kouprie and Sleeswijk Vissor (2009)

	resonance and cognitive reasoning.				
36	Empathy may improve the likelihood of making decisions that will have long-term positive outcomes for people.				Starkey and Tempest (2009)
37	An empathic framework can inform creative possibilities and richer decision spaces.				Starkey and Tempest (2009)
38					
39	**Design Thinking and Strategy**				
40	Design thinking has an opportunity to contribute to business strategy as markets struggle with growing complexity and organizations look for new approaches to recognize, anticipate and understand challenges and opportunities.	YES	Theme 9	The hard work of design thinking takes time and patience, as the rigour and results come through the experiences in the actual journey, which may not be comfortable or acceptable to all business students.	Rusk (2016), Friedmann (1973)
42	Leadership and management theory is based on military strategy and as such, business strategy is often rooted in rational and analytical science, which is different than a design thinking approach.				
43	Traditional hierarchical ways of business strategy need to be more flexible in order to realize the complicated need for competitive advantage.				
44	In a world that is unpredictable and complex, we need more collaborative approaches that inform strategies that both address current and future needs.	YES	Theme 7	A design thinking approach enables business students to address complex needs through collaborative hands on creative skills, and when balanced with a business approach, can become a marketplace and leadership differentiator. The combination of both a business approach and a design thinking approach enables them to see and lead more holistically.	Rusk (2016), Moss Kanter (1997)
45	Business leaders don't just need to understand design better, they need to become designers themselves.	YES	Theme 4	Business students who use design thinking will be able to understand people more deeply through qualitative ethnographic field work, which will help inform and frame meaningful opportunities or problems that people actually care about.	Dunne and Martin (2006), Liedtka and Ogilvie (2011)
46	Design thinking can help facilitate 'big picture" understanding of multifaceted problems that are central to strategic thinking and planning.	YES	Theme 7	Design thinking provides value to business students by enabling them to view the world through a different way of understanding, rooted in empathy, and allowing them to discard inappropriate assumptions.	Fraser (2007)

47	Strategy is often developed and measured through the lense of optimization and exploitation, while design thinking provides a third lense, which is validity.				
48	Good strategy involves making choices and the more well-rounded the inputs are to the decision-making process, the more meaningful the decisions could be.				
49	Design as a stand-alone is not sufficient for a business strategy, however, design can inform the strategy of evolving ecosystems.				
51	**Design and Business: Context and Learning**				
52	**The Business Gap for Design**				
53	The business world often sees design as irrational.	YES	Theme 5	Business students are both curious and skeptical of design thinking, however, engaging students through hands on application, builds both understanding and confidence in the subject as well as their ability to apply design thinking beyond the classroom.	Dorst (2015), Burnette (2016)
54	Business often emphasizes analyzing existing information, while design thinking often emphasizes the discovery and understanding of new knowledge.				
55	Business processes are based on an analytics first approach, while design processes are more subjective and qualitative in nature.	YES	Theme 8	Business students generally don't have a creative background and often the tactical skills associated with design thinking don't come naturally and can be difficult to learn.	Lockwood (2002), Dorst (2015), Liedtka and Ogilvie (2011)
56	Business is not comfortable with ambiguity, while design thinking thrives in ambiguity.				
57	Most business approaches are linear, while a design thinking approach is iterative and non-linear.				
58	Business relies on objectivity and rationality while design thinking relies on the	YES	Theme 1	Empathy, which business students are very uncomfortable, is fundamental to design thinking and can help connect people and organizations to problems that matter.	Dorst (2015), Junginger and Faust (2016), Liedtka and Ogilvie (2011)

	understanding of the human experience.				
59	Business is often tactically focused and less innovation oriented.				
60	Business rewards systems are rooted in probability, while design is possibility based.	YES	Theme 8	Business students are uncomfortable with ambiguity and empathy, which complicates their willingness to explore, often leading them to default to quantitative approaches that quickly lead to shallow solutions.	Lockwood (2002), Junginger and Faust (2016), Liedtka and Ogilvie (2011)
61	Business values stability and control, while design is comfortable in uncertainty.				
62	Business minded individuals and design minded individuals are often uncomfortable with each other.				
64					
65	**Design and Business School**				
66	Business students often default to modes of problem solving that they are comfortable with and are readily used by peers in the business school.	YES	Theme 7	Business students who have a design thinking skillset, see it as a competitive advantage over business students who do not have the skillset.	Boland Jr. and Collopy (2004)
67	Business schools emphasize an analytical approach with a focus on planning and optimization.	YES	Theme 8	Business students are general practical thinkers and often have difficulty seeing how to put a design thinking approach into practice, which can lead to further skepticism, and a prioritization of business skills over design thinking skills.	Glenn, Suciu, Baughn, and Anson (2015)
68	Analytical methods are best suited to clearly understood problems, where data can be a predictor of the future.				
69	Design thinking is well suited for problems that are ill defined and not understood.				
70	Cross disciplinary approaches that enable seeing and acting more holistically, can enable more and better innovation.				
71					

72	Business school education often focuses in on 'what is," while design is often focused on "what could be."				
73	Design skills such as empathy, problem framing and reframing, human centered storytelling and visualization are elusive to business students.	YES	Theme 4	Business students are able to learn the tactical elements of design thinking through an immersive hands-on experience.	Liedtka and Ogilvie (2011), Rusk (2016)
74	The teaching of design tactics, such as ethnographic research, framing, ideation, visualization, and prototyping are not part of most business school curriculum.	YES	Theme 4	Business students are able to learn the tactical elements of design thinking through an immersive hands-on experience.	Handy (1989), Fraser (2006), Starkey and Tempest (2009)
75	The structure of business school classes and design classes is very different.	YES	Theme 4	A culture of critique, which is fundamental to design thinking and often foreign in the business school, enables business students to shape better ideas in a truly collaborative and open way which is predicated on iteration.	Glenn, Suciu, Baughn, and Anson (2015)
76	Ethnographic research often feels 'fuzzy" or 'soft" to business students who are primarily data driven.				
77	Creativity, which is fundamental to design is not empathized or taught at most business schools.				
78	Business school students exposed to design thinking may have a creative awaking.				
79					
80	**Design Thinking and Business Thinking**				
81	The design world and the business world often dismiss each other's perspectives.				
82	Business thinking is guided by what is familiar, predictable, productive and rewarding in the short term. It is reliability based.	YES	Theme 7	Design thinking provides value to business students by enabling them to view the world through a different way of understanding, rooted in empathy, and allowing them to discard inappropriate assumptions.	Burnette (2016), Dunne and Martin (2006)
83	Design thinking is guided by the opportunity to broaden and reframe the situation, reconceive what is possible, and resolve it through	YES	Theme 2	Design thinking needs to be coupled with business thinking in order to see value from the student's perspective and to realize value from the business organization perspective.	Dorst (2015), Martin (2009)

	creative means. It is validity based.				
84	Design thinking is human centric, while business thinking is oriented towards command and control.				
85	Business thinking needs to embrace design thinking in order to help business leaders create new value, that cannot be found through analyzing the past.				
86	Problem solving, based on analyzing the past, is often categorized by type of solution rather than type of problem.	YES	Theme 7	A design thinking approach enables business students to get closer to the true needs of the user/customer, further enabling them to identify the right problem to solve.	Martin (2009)
87	Business thinking often exploits existing knowledge and conditions, which can lead to mastery of the situation.				
88	Design thinking explores unknowns and moves to create new knowledge, which can lead to originality.				
89	Design thinking and business thinking are both process oriented.	YES	Theme 7	A design thinking approach enables business students to address complex needs through collaborative hands on creative skills, that when balanced with a business approach can become a marketplace and leadership differentiator. The combination of both a business approach and a design thinking approach enables them to see and lead more holistically.	Fraser (2011)
90	The opportunity to merge different knowledge perspectives can be seen as a significant condition for innovation.				
91	Qualitative approaches in the discovery and creation phases of innovation, as well as quantitative approaches in the scale and execution phase, all contribute to knowledge needed to be innovative.	YES	Theme 2	Design thinking needs to be coupled with business thinking in order to see value from the student's perspective and to realize value from the business organization perspective.	Topalian (2012), Hansen and Andreasen (2006), Martin (2009), Tovey (2016),
92	Design and business co-creation is critical to the enterprise viability in an increasingly complex and global world.				

93	Cross disciplinary approaches can inform individuals and organizations, and enable more and better innovation, through seeing and act more holistically.	YES	Theme 7	A design thinking approach enables business students to get closer to the true needs of the user/customer, further enabling them to identify the right problem to solve.	Meyer and Schwager (2007), Topalian (2012),
95					
96	**Design Based Learning for Business**				
98	In order to be competitive, business should adopt a design attitude and approach, however, current education strategies produce a knowledge gap between design and business.	YES	Theme 2	Design thinking needs to be coupled with business thinking in order to see value from the student's perspective and to realize value from the business organization perspective.	Brown (2008), Avital and Boland Jr. (2008), Lockwood (2002)
99	The primary objective of higher education is the generation of new knowledge or the advancement of knowledge. A Design thinking approach in business education provides a platform for generating new knowledge and advancing knowledge through qualitative means that are inheritably different from those utilized in the business school.	YES	Theme 2	The qualitative discovery approach associated with design thinking is complementary to the quantitative execution approach often found in business curriculums. The combination of both proved to be valuable to business students based on their classroom experiences.	Hollern (2016), Liedtka and Ogilvie (2011), Teixeira (2009)
100	Continuous innovation is seen as a key to competitive advantage, however, systematic and familiar approaches, which often does not include design thinking, are predominantly used to innovate in school and in practice.				
101	Design thinking is multi-epistemic and uses multiple ways of knowing including; thinking, feeling, sensing, and intuition. All of which can inform business education and practice approaches.				
102	Design thinking in business education cannot be a product of discourse.	YES	Theme 5	Learning design thinking through a real project that had business context gives business students conviction that it is valuable, and also allows them to see and experience first-hand how they could utilize and apply directly design thinking beyond an intellectual exercise.	Hollern (2016), Teixeira (2009)

103	Today's knowledge based economy, could benefit from design thinking competencies such as; qualitative thinking, speculation, ideation, and prototyping.				
104	Ideally, innovators would be T-Shaped, in that they have depth in one domain and breath in many others. This would position innovators to best tackle complex challenges.				
105	Modern organizations need professionals who have multi-faceted competencies.	YES	Theme 1	A critical skill that the business world is looking for is the ability to drive innovation and to be creative, and in order to be innovative, execution and creative skills are fundamental. Most business students coming into business school have little to no experience with creativity and design thinking.	Sutton (2001), Teixeira (2009)
106	Design thinking can be considered a change tool, further supporting its competitive advantage for a business world seeking continuous innovation.	YES	Theme 9	For business students, design thinking can often be seen as not serious or rigorous because it looks and feels so very different from business school content, which leads many to be unwilling to immerse themselves in the process. However, for business students who have learned the subject through an immersive project based experience, they find design thinking valuable.	Hollern (2016), Teixeira (2009)
107	Design can influence perception, which can influence customer satisfaction.	YES	Theme 1	Empathy, which business students are very uncomfortable, is fundamental to design thinking and can help connect people and organizations to problems that matter.	Fraser (2011), Liedtka and Ogilvie (2011)
109	If education could be the catalyst for an integration of design and business, a new kind of leader could emerge.	YES	Theme 9	The hard work of design thinking takes time and patience, as the rigour and results come through the experiences in the actual journey, which may not be comfortable or acceptable to all business students.	Kolo and Merdes (2016), Teixeira (2009)
110	Collaborative learning approaches will be required for design and business to integrate.				
111	Design thinking needs to be learned and nurtured through qualitative project based activities, that are often not directly relatable to scientific approaches found prolifically in business school.	YES	Theme 9	The hard work of design thinking takes time and patience, as the rigour and results come through the experiences in the actual journey, which may not be comfortable or acceptable to all business students.	Kolo and Merdes (2016), Meisiek (2016)
112	The favorable condition for cross-pollinated design and business learning would be a studio environment, which is prevalent in traditional design education.				
113	A studio approach to learning, inspires experimentation and iteration, and the				

	combination of design and business in such an environment could lead to breakthroughs of new knowledge.				
114	The studio environment for these two different worlds, design and business, must be inclusive and respectful of the skills that both bring.	YES	Theme 4	A culture of critique, which is fundamental to design thinking and often foreign in the business school, enables business students to shape better ideas in a truly collaborative and open way which is predicated on iteration.	Meisiek (2016), Tovey (2009), Rusk (2016)
115	The studio environment, which is a community of practice, is totally different than the environments for learning in business schools.	YES	Theme 6	A studio culture, which is critical to design thinking and creative problem solving, is not central to traditional business education.	Smith Taylor (2009), Zidulka (2016), Lawson (2006)
118					
119	**Business School: Context and Curriculum**				
121	**Business School Context**				
122	The Masters of Business Administration (MBA) was first launched in 1921 and has a long history as being the "required" degree for business management.				
123	The universal MBA curriculum was reframed to be more scientific in nature after a report found programs granting an MBA were not generally rigorous.				
124	The scientization of business schools followed the social science model where rigour overrode relevance.				
125	Business school faculty often study business at a distance and believe business to be science oriented.				
126	Business schools have what is called, "physics envy," in that they try to use mathematical expressions of their fundamental concepts in order to move them closer to the harder				

	sciences such as physics.				
127	Science based educational approaches are often critical of liberal arts approaches.				
128	Business schools historically have been guided by strict rules of engagement, are rigorously focused and are linear in process. All supporting a scientific approach.	YES	Theme 7	A design thinking approach enables business students to get closer to the true needs of the user/customer, further enabling them to identify the right problem to solve.	van Aken (2001), Clarke and Primo (2012)
129	Business school approaches are often excessively analytical, utilizing predominantly quantitative techniques.	YES	Theme 3	Design thinking is not simply an intellectual exercise, and as such, it must be taught in a fundamentally different way than business school content is delivered to and absorbed by students.	Bennis and O'Toole (2005), Khurana and Spender (2013)
130	There is often a deficit in generative, lateral and innovative thinking skills in business schools.				
131	Business students, often struggle with unstructured problems, ambiguous data, rapidly changing environments – which are common in today's emerging industries and nascent markets.	YES	Theme 8	Business students are uncomfortable with ambiguity and empathy, which complicates their willingness to explore, often leading them to default to quantitative approaches that quickly lead to shallow solutions.	Triggs (2011)
132	Business school students are predominantly taught and learn through structure lectures and case studies, which is a passive approach.	YES	Theme 6	A studio culture, which is critical to design thinking and creative problem solving, is not central to traditional business education.	Bennis and O'Toole (2005), Datar, Garvin, and Cullen (2010)
133	Experiential learning through project based experiences is not commonplace in business schools.	YES	Theme 5	Learning design thinking through a real project that had business context gives business students conviction that it is valuable, and also allows them to see and experience first-hand how they could utilize and apply directly design thinking beyond an intellectual exercise.	Mintzberg (2009), Datar, Garvin, and Cullen (2010)
134	Integration skills such as thinking about issues from diverse points of view, shifting angles and framing are often lacking in business schools.	YES	Theme 4	Business students who use design thinking will be able to understand people more deeply through qualitative ethnographic field work, which will help inform and frame meaningful opportunities or problems that people actually care about.	Datar, Garvin, and Cullen (2010)
135	Acting creatively and innovatively, such as finding and framing problems, engaging in generative and lateral thinking and experimentation is often lacking in business schools.				

136					
137	**Business School Backgrounds and Curriculum**				
138	Harvard University launched the first Masters of Business Administration (MBA) in 1921, and is consistently regarded as the top-rated business school in the United States.				
139	Of the top ten rated business schools in the United States, traditional teaching approaches such as the case study method and lectures dominate the pedagogy. The minimum percentage of traditional teaching approaches is 80% from the Yale School of Management, while the maximum percentage is 95% from Harvard.	YES	Theme 6	A studio culture, which is critical to design thinking and creative problem solving, is not central to traditional business education.	Bloomberg BusinessWeek
140	Experiential learning approaches, which are predominate in design thinking, are not widely used in business schools. Harvard, the top-rated business school in the United States, only utilizes 5% of their pedagogy around experiential learning.	YES	Theme 3	Design thinking is action oriented and is best taught and learned through a lived experience that is project based, which may prove to be uncomfortable to some business students.	Bloomberg BusinessWeek, hbs.edu, chicagobooth.edu, gsb.stanford.edu, wharton.upenn.edu,kellogg.northwestern.edu, gsb.columbia.edu, mitsloan.mit.edu, hass.berkeley.edu, tuck.dartmouth.edu, som.yale.edu
142	The Massachusetts Institute of Technology – Sloan School of Business has the highest rate of experiential learning opportunities at 20% of their pedagogy, within the top ten business schools in the United States. They do not have a design thinking offering within their core business school offerings.				

143	The case study method, pioneer by Harvard University, is widely used in business schools. A business case is presented to the student, in which they must read, evaluate and chose a path that “best” addresses the business issue. The cases are done as simulations, based on historical information and are conducted in isolation from the actual stakeholders and conditions. The objective is to develop and test the students analytical and communication skills.	YES	Theme 5	Business students are both curious and skeptical of design thinking, however, engaging students through hands on application, builds both understanding and confidence in the subject as well as their ability to apply design thinking beyond the classroom.	hbs.edu, Bloomberg BusinessWeek
144	The case study method is not human centric, and does not involve real time discovery research, problem framing or reframing, ideation, prototyping and iteration.	YES	Theme 6	Business students found that a studio experience is valuable to learning design thinking.	Bloomberg BusinessWeek
145	The case study method is singular solution driven, in which debate and persuasion are used to defend and promote the solution.				
146	Harvard business students read over 500 cases over a two-year period.				
147	The lecture method is widely utilized by business schools and is focused on the academic members wisdom and presentation skills. It is dialog driven, with the academic member being front and center.	YES	Theme 6	A studio setting invites more open collaboration, experimentation and making, than a formal classroom setting, which is intended for the giving and receiving of lectures and cases.	Bloomberg BusinessWeek
148	Most business school class sizes range from 60-90 students.	YES	Theme 6	A studio setting invites more open collaboration, experimentation and making, than a formal classroom setting, which is intended for the giving and receiving of lectures and cases.	hbs.edu, chicagobooth.edu, gsb.stanford.edu, wharton.upenn.edu,kellogg.northwestern.edu, gsb.columbia.edu, mitsloan.mit.edu, hass.berkeley.edu, tuck.dartmouth.edu, som.yale.edu
150					

151	**Business School Required Core Curriculum**				
153	All business schools rated within the top ten in the United States have a fixed core of business class that are required. The remaining classes are considered electives, in which students fill those with topics that they want to further master with in the business school.				
154	All business schools rated within the top ten in the United States require a fixed core that includes; finance, accounting, microeconomics, analytics, strategy, leadership, operations, marketing, decision sciences. The core is primarily quantitatively analytical.	YES	Theme 8	Business students are uncomfortable with ambiguity and empathy, which complicates their willingness to explore, often leading them to default to quantitative approaches that quickly lead to shallow solutions.	hbs.edu, chicagobooth.edu, gsb.stanford.edu, wharton.upenn.edu,kellogg.northwestern.edu, gsb.columbia.edu, mitsloan.mit.edu, hass.berkeley.edu, tuck.dartmouth.edu, som.yale.edu
155	Only three business schools rated within the top ten in the United States have a design thinking component within the core business curriculum.	YES	Theme 9	For business students, design thinking can often be seen as not serious or rigorous because it looks and feels so very different from business school content, which leads many to be unwilling to immerse themselves in the process. However, for business students who have learned the subject through an immersive project based experience, they find design thinking valuable.	som.yale.edu, hass.berkeley.edu, kellogg.northwestern.edu
156	The Kellogg School of Management at Northwestern University, has a full credit design thinking offering that is only offered to a specialized group of MBAs. This class is core to that group of 60 students, but not core to the remaining 418 students in the business school. The course, “Research-Design-Build,” is experiential and project focused. The course is studio based.	YES	Theme 8	Business students are general practical thinkers and often have difficulty seeing how to put a design thinking approach into practice, which can lead to further skepticism, and a prioritization of business skills over design thinking skills.	kellogg.northwestern.edu
157	The Hass School of Business at the University of California Berkeley, has a half credit design thinking course offering that all 250 business students take. It primarily uses lectures, cases, readings and small class projects. The course, “Problem Fining - Problem				

	Solving," is not studio based.				
158	The Yale School of Management at Yale University, has a half credit design thinking course offering that all 334 business students take. It primarily uses lectures, cases, readings and small class projects. The course, "Innovator," is not studio based.				
159	Of the three schools that offer a design thinking course within their respective business schools, all three have different pedagogies and learning environments.	YES	Theme 3	Design thinking is not simply an intellectual exercise, and as such, it must be taught in a fundamentally different way than business school content is delivered to and absorbed by students.	som.yale.edu, hass.berkeley.edu, kellogg.northwestern.edu

Appendix T

Demonstrator Curriculum

Format:

Recommended Teaching Team

Taught in a collaborative 3-person team teaching environment, utilizing diverse skills and real-world experiences to shape a robust learning experience.

- Academic Member (1) background: design thinking core concepts and methodology expertise.
- Academic Member (2) background: design research core concepts process and methodology expertise.
- Academic Member (3) background: business strategy expertise

Recommended Challenge Partner Context

The industry challenge partner will provide context in the following areas:

- Strategy
- Operations
- Finance
- Research
- Design
- Manufacturing

- Marketing
- Sustainability

Recommended Class Size

- A 30 student class, allowing for hands on teaching, mentorship and feedback. The ratio of 10 students per academic member creates a unique learning environment that is very personalized and attentive.
- All 3 academic members will rotate organically during the activity sessions, meeting and working with individual teams.

Recommended Teaming Approach

- Teaming and collaboration is critical to design thinking. As such, students will self-form into 6 teams of 5.
- Within each studio session, 2 student teams will work with one academic member during critiques. This ensures that everyone is active and participating in the studio culture. Teams and academic members will rotate every studio session to ensure point of view diversity and fresh perspectives on the topic.

Recommended Studio Format

- A 3-hour studio, allowing for more interaction and application of concepts, critique and exercises.
- The setting takes place in a flat classroom with movable furniture, presentation

space, and material carts for development work.

- Student developmental work will be created, iterated and shared in studio.
- Student developmental work will not be generated electronically (PowerPoint, Keynote, Excel, Adobe Suite, etc.), which often leads to "polishing" an idea. A "polished" idea invites criticism because we naturally see problems with high fidelity concepts.
- Student developmental work will be generated using "paperpoint." This term refers to

  non-digital communication tools (sticky notes, easel sheets, sharpies, paper, cardboard, foam core, photos, etc.). This format often leads to "developing" an idea. A "developing" idea invites conversation because we feel like we can contribute to the potential of a low fidelity concept.
- Each team will be given a physical portfolio of "paperpoint" materials to use as well as multiple 4'x8' portable pin up boards. These items will be labeled and securely stored in the studio.

Recommended Learning Objectives

Business students will learn how to:

- Approach the development of innovative solutions with a design thinking mindset.
- Gain deep empathy for stakeholders through contextual immersion.
- Use both quantitative and qualitative primary research to inform opportunities.
- Develop tangible prototypes and examples to elicit rich information from

research subjects.

- Derive actionable insights from research.
- Discover, frame, and potentially reframe meaningful opportunities for people.
- Develop frameworks from research for use in making inductive leaps and developing resonant ideas.
- Quickly and effectively brainstorm ideas, narrow options and select compelling propositions.
- Develop rapid visualization skills.
- Rapidly prototype potential solutions to learn and push ideas forward.
- Shape stories that illustrate user scenarios, solutions and the value they offer.
- Understand and shape ideas based on Desirability (makes sense to people and for people), Feasibility (functionally possible within the foreseeable future), Viability (likely to be part of a sustainable business model).
- Develop a business model canvas to support idea.
- Develop compelling presentations that clearly communicate and visually support the story you want to tell.
- Apply these skills to a real challenge, with real users and with real business factors.

Recommended Tools/Tactics

Business students will leave understanding how to use:

- In-field ethnography discussion structures
- Interview facilitation skills

- Research insights
- Framework structures
- Culture of critique
- Rapid visualization of ideas through sketching
- Rapid prototyping of ideas
- Efficient iteration tactics
- Effective brainstorming strategies
- Communication design strategies
- Storyboarding “arcs” for use in building conviction for ideas/solutions
- Compelling business model structures for new value propositions
- Notable deliverable “formats” to bring attention to ideas

Glossary of Terms to use in Curriculum

- Design Thinking - A methodology and approach that enables creative problem solving, which is developed through multiple solutions and iterated with a focus on contextual human understanding.

- Solution Oriented - A design thinking approach is not about polishing one idea and getting to the ultimate solution. It is about framing and developing a wealth of ideas informed by research with an iterative mindset.

- Empathy - The cornerstone of design thinking. No decision is made without a deep understanding of all the relevant stakeholders, which leads to empathy as a driving force. This is done by placing oneself in the shoes of another and feeling what they are experiencing. It involves developing an understanding of both a person's emotional and rational needs and wants, which creates a heightened sensitivity to the audience.

- Human Centered - An approach to solving problems that starts with the people you are trying to solve for and ends with solutions that meet their needs.

- Ethnographic Research - An anthropology-based research approach used in the field of social science to study people and cultures in context. It seeks to collect deep insights on people and the rationale behind their behavior. Additionally, smaller sample sizes are utilized.

- Studio - A creative physical environment that enables and promotes a hands-on experience in an open studio format, that allows for real-time collaboration, feedback and iteration of ideas.

- Culture of Critique - A design thinking approach uses critique as a key platform for helping shape and push work to be its best. A culture of critique recognizes that it is about the work and not personal. It is important to keep in

mind that the culture of critique is about pushing work forward and building up ideas in a constructive way.

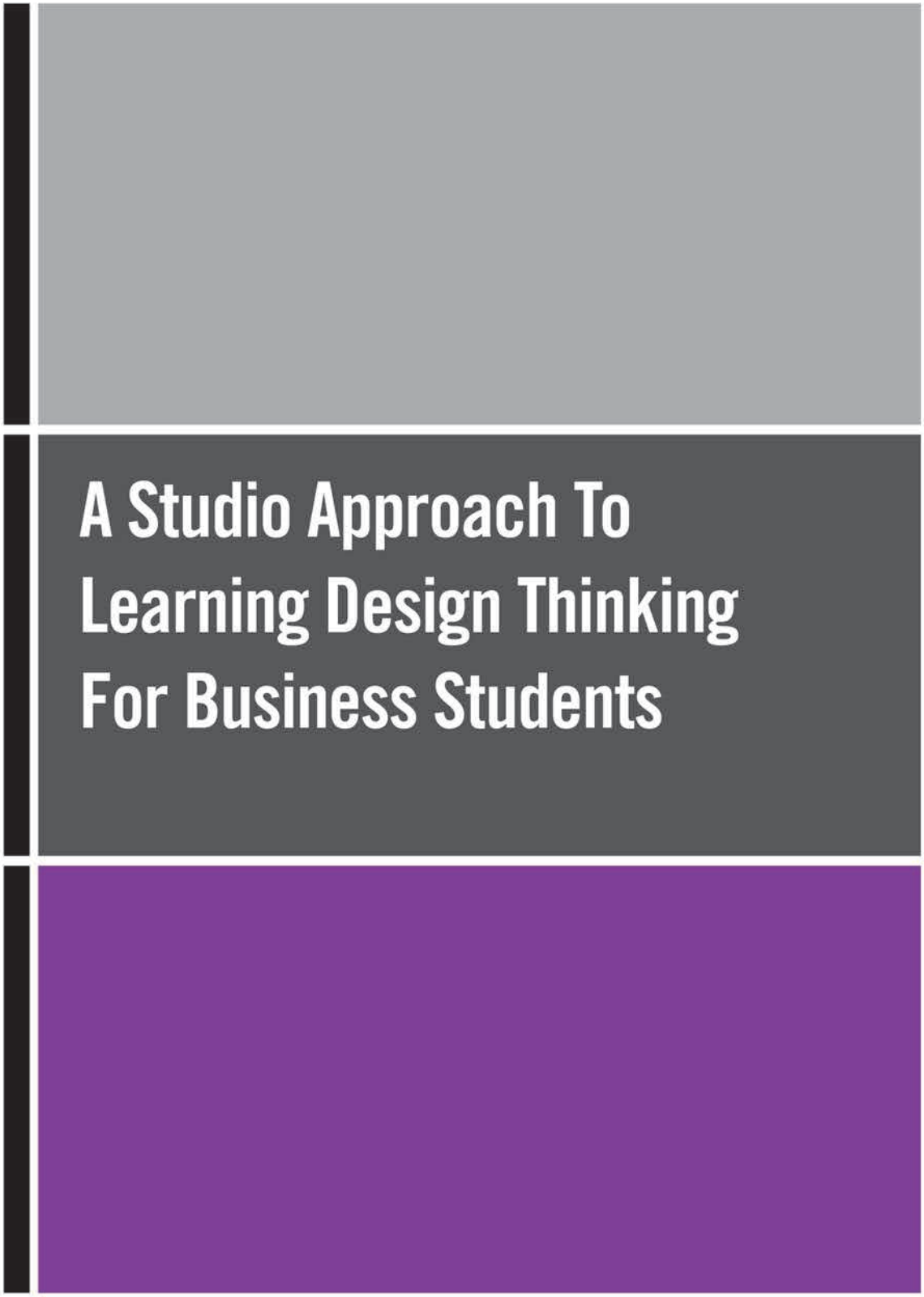
- Paperpoint - Non-digital communication of work done to date. Teams use materials provided (sticky notes, easel sheets, sharpies, paper, photos, etc.) to shape and post developmental content, which is ultimately your design thinking "data."

- Gallery Walk - The real-time review and feedback loop by academic members and students in studio.

- Fireside Chat - Open public discussion in studio to answer questions, give feedback about overall content, reflect on lessons learned, discuss experiences encountered in the field and in studio.

- Challenge Partner - The collaborative industry partner who brings a real-world challenge to the class.

Studio Modules:



Studio 1

Introduction

Module A **CONTEXT**	• What is design thinking? • What are the core concepts behind design thinking? • What is the difference between design and design thinking? • How does design thinking integrate into business? • What is the design thinking process?
Module B **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module A.
Module C **ACTIVITY**	• **Design Thinking Sprint:** Students will pair up and go through a multi-phase in studio exercise, in which they will tackle a pre-assigned challenge area. They will explore and utilize multiple stages in the design thinking process.
Module D **REFLECTION**	• **Fireside Chat:** Interactive share out and group discussion on lessons learned,inspiration, challenges and successes experienced in Module C.
Module E **CHALLENGE**	• Introduction to business design challenge and framework for how it will integrate throughout the class.
Module F **CONTEXT**	• Lessons learned and key take aways from Studio 1. • Introduction to secondary research core concepts.
Module G **ASSIGNMENT**	• Conduct secondary research as per business design challenge and prepare questions pertaining to market and challenge partners specific business challenges.

Studio 2

Design Research 1.0

Module A CHALLENGE	• Kick off of business design challenge with challenge partner. Content presented includes existing strategy, brand positioning, market sizing, business constraints, existing technologies, sales data, demographic data, strengths, weaknesses and threats.
Module B REFLECTION	• **Fireside Chat:** Interactive group discussion on Module A.
Module C CONTEXT	• What is design research? • What are the core concepts behind design research? • What is the role of empathy in design research? • How does design research inform design thinking? • What methodologies are used in design research?
Module D REFLECTION	• **Fireside Chat:** Interactive group discussion on Module C.
Module E CONTEXT	• What are research objectives? • What is a research plan?
Module F ACTIVITY	• Teams will identify preliminary research objectives in studio. • Teams will develop preliminary research plan in studio.
Module G ASSIGNMENT	• Refine research objectives. • Refine research plan.

Studio 3

Design Research 2.0

Module A **CRITIQUE**	• **Gallery Walk:** Teams will present research objectives and research plan for direct feedback.
Module B **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module A.
Module C **ACTIVITY**	• **Refinement:** Students will refine research objectives and research plan based on direct feedback from Gallery Walk in studio.
Module D **CONTEXT**	• What is a research design discussion guide?
Module E **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module D.
Module F **ACTIVITY**	• Teams will develop preliminary research discussion guide in studio.
Module G **ASSIGNMENT**	• Refine research objectives. • Refine research plan. • Refine research discussion guide.

Studio 4

Design Research 3.0

Module A **CRITIQUE**	• **Gallery Walk:** Teams will present research objectives, research plan and research discussion guide for direct feedback.
Module B **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module A.
Module C **ACTIVITY**	• **Refinement:** Students will refine research discussion guide based on direct feedback from Gallery Walk.
Module D **CONTEXT**	• Deep dive into principles and practice of design research fieldwork. • What is an observation? • How do I prototype design research stimulus?
Module E **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module D.
Module F **ACTIVITY**	• Teams will identify and develop preliminary research stimulus in studio.
Module G **ASSIGNMENT**	• Refine research stimulus. • Begin design research fieldwork.

Studio 5

Framing Research for Design 1.0

Module A **CRITIQUE**	• **Gallery Walk:** Teams will present preliminary findings of design research fieldwork for direct feedback.
Module B **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module A.
Module C **CONTEXT**	• What is design research synthesis? • What is an insight? • What is a framework for design research?
Module D **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module C.
Module E **ACTIVITY**	• Teams will identify patterns found in preliminary design research fieldwork in studio.
Module F **ASSIGNMENT**	• Continue design research fieldwork.

Studio 6

Framing Research for Design 2.0

Module A **CRITIQUE**	• **Gallery Walk:** Teams will present findings of design research fieldwork for direct feedback.
Module B **CONTEXT**	• How and why would we reframe the challenge opportunity? • What does reframing look like based on design research?
Module C **ACTIVITY**	• Teams will synthesize research based on emerging patterns and new knowledge discovered through the design research process.
Module D **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module C.
Module E **ACTIVITY**	• Teams will develop preliminary insights based on synthesized research in Module C. • Teams will develop preliminary frameworks in support of insights.
Module F **ACTIVITY**	• Teams will identify patterns found in preliminary design research fieldwork in studio.
Module G **ASSIGNMENT**	• Synthesize design research. • Generate insights. • Generate frameworks to support insights.

Studio 7

Research Informing Design

Module A **CRITIQUE**	• **Gallery Walk:** Teams will present insights and frameworks in support of synthesized research for direct feedback.
Module B **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module A.
Module C **CONTEXT**	• What is a "how might we" question and how is it generated from insights?
Module D **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module C.
Module E **ACTIVITY**	• Teams will select highest potential insights based on Module A feedback in studio. • Teams will generate "how might we" questions for insights in studio.
Module F **CONTEXT**	• How do I generate an idea based on an insight from a "how might we" question? • What is brainstorming? • What is solo storming?
Module G **ASSIGNMENT**	• Refine "how might we" questions. • Generate solo storm preliminary concepts.

Studio 8

Visualizing Design

Module A **ACTIVITY**	• Team members present share solo storm concepts to inform group brainstorm. • Team members conduct structured brainstorm on each "how might we" question, building on initial solo storm concepts.
Module B **CRITIQUE**	• **Gallery Walk:** Teams will present concepts from brainstorming for direct feedback.
Module C **ACTIVITY**	• Team will conduct round 2 of structured brainstorming based on feedback in Module B. • Teams will consider how to create a solution space ecosystem.
Module D **ACTIVITY**	• Rapid visualization exercise, Part 1. • Storyboard as prototype. • Rapid visualization storyboard exercise, Part 1.
Module E **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module D.
Module F **ACTIVITY**	• Rapid visualization exercise, Part 2. • Rapid visualization storyboard exercise, Part 2.
Module G **ASSIGNMENT**	• Further refine preliminary concepts from brainstorming session from Module C. • Develop preliminary solution space ecosystem.

Studio 9

Refining Design

Module A **CRITIQUE**	• **Gallery Walk:** Teams will present preliminary solution space ecosystem for direct feedback.
Module B **CONTEXT**	• Introduction of concept rationale framework – desirability / feasibility / viability / risk / payoff / innovation level.
Module C **CONTEXT**	• How is prototyping used in design thinking? • How do I prototype a business design solution?
Module D **ACTIVITY**	• Teams will refine ecosystem based on concept rationale framework. • Teams will consider how to prototype their concept.
Module E **CRITIQUE**	• **Gallery Walk:** Teams will present ecosystem and concept rationale framework for direct feedback.
Module F **ASSIGNMENT**	• Further refine solution space ecosystem and prototype. • Further refine concept rationale. • Storyboard ecosystem and rationale. • Test ecosystem concept with potential users.

Studio 10

Refining and Building

Module A **CRITIQUE**	• **Gallery Walk:** Teams will present storyboard of solution ecosystem, concept rationale and prototype as well as insights from testing for direct feedback.
Module B **REFLECTION**	• **Fireside Chat:** Interactive group discussion on Module A.
Module C **ACTIVITY**	• Teams will further refine and build out concept and story.
Module D **ACTIVITY**	• Teams will further shape rationale and strategy of concept through the use of a business model canvas.
Module E **ASSIGNMENT**	• Finalize concepts, ecosystem, rationale, business model canvas and narrative.

Studio 11

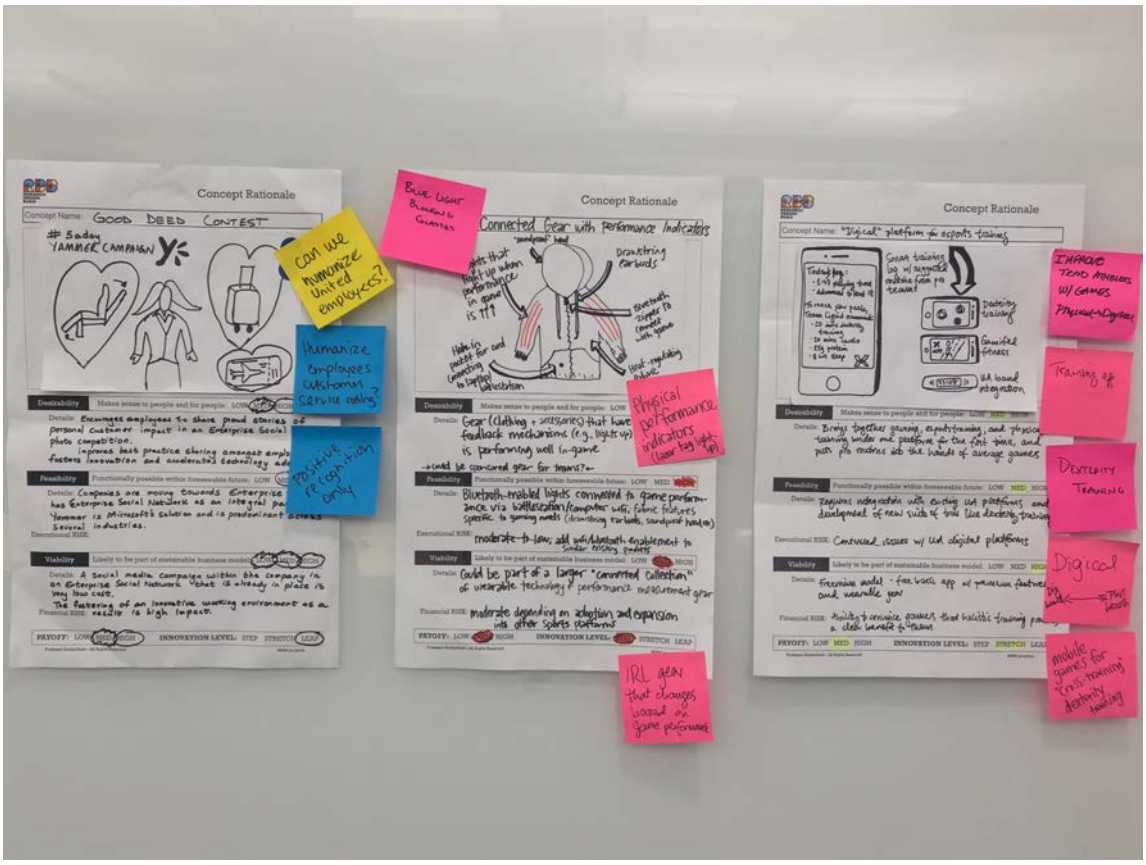
Final Presentation – Deliverable Consideration Set

DESIRABILITY	**The solution makes sense to people and for people.** • Informative design research • Compelling insights – rooted in deep empathy
FEASIBILITY	**The solution could be functionally possible.** • Technology considerations • Operational considerations
VIABILITY	**The solution is likely to be part of a sustainable business model.** • Financial considerations • Competitive considerations
RISK	**The solution risk is considered.** • Brand considerations • Executional considerations • Safety considerations
PROCESS	**The solution utilitizes a holistic approach.** • Design thinking and business thinking • Rooted in a user-centered narrative
CREATIVE	**The work demonstrates...** • Creative mindset • Creative storytelling • Creative methodology • Creative prototype(s)
INNOVATIVE	**The solution introduces...** • New ideas • Originality

Appendix U

Concept Rationale Worksheet

Examples of utilized worksheets are reflected below:



Worksheet:

Concept Rationale Worksheet:

A Tool For Further Shaping Design Thinking Concepts For Business Students

Concept Rationale Worksheet

Concept Name:

Capture idea here or attach concept half sheet...

DESIRABILITY Makes sense to people and for people: **LOW MED HIGH**

Details:

FEASIBILITY Functionally possible within foreseeable future: **LOW MED HIGH**

Details:

Executional RISK:

VIABILITY Likely to be part of sustainable business model: **LOW MED HIGH**

Details:

Financial RISK:

PAYOFF: LOW MED HIGH	**INNOVATION LEVEL: LOW MED HIGH**